Nature on the Page:
the Print and Manuscript Culture of Victorian Natural History

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Nature on the Page: the Print and Manuscript Culture of Victorian Natural History

Exhibition and Catalogue by Maria Zytaruk

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Foreword

The year 2019 marks the two hundredth anniversary of the birth of Queen Victoria (1819 – 1901), Britain's second longest serving monarch. She succeeded to the throne in 1837 and governed the British Empire until 1901. Victoria's reign marked a period of massive cultural, political, and industrial upheaval. At the same time, the Victorian era was the golden age of natural history. The Victorian enthusiasm for natural history is often described as series of crazes – over ferns, shells, and birds, to name but a few. Scholars of the Victorian era have attributed this national obsession as a reaction to the rapid development of science and technology at that time, as well as the move from rural communities to industrialized cities. These upheavals led Victorians to turn back to nature and also caused them to romanticize the wonders of their natural world.

To mark Queen Victoria's bicentennial, Maria Zytaruk's exhibition, *Nature on the Page: The Print and Manuscript Culture of Victorian Natural History,* explores the print culture that emerged from and fueled this Victorian preoccupation with natural objects. Using the Thomas Fisher Rare Book Library's outstanding Victorian Natural History Collection of over a thousand books dedicated to the study of natural history in nineteenth-century Great Britain, the exhibition showcases the reading and collecting practices of naturalists. The manuscripts, printed books, and specimens on display reflect the Victorian commitment to the study of the natural world all around them.

I wish to acknowledge the wonderful support of the Friends of the Thomas Fisher Rare Book Library for this exhibition and this catalogue. Above all, I wish to thank Maria for this remarkable exhibition and for broadening our understanding of an important aspect of Queen Victoria's era and the print culture that supported it.

Loryl MacDonald
Interim Director of the Fisher Rare Book Library

Introduction

It is still possible to discover, among the stalls at antiquarian book fairs, the odd seaweed album from the Victorian period. These compilations range from elegant gilt albums, in which spidery seaweed samples are in silhouette mounts, to more modest scrapbooks with their paper covers secured with a pretty ribbon. Queen Victoria is thought to have assembled such a seaweed album when she was a young girl.[1] In some instances, the album is a miniature algae herbarium with specimens carefully labelled in Latin according to nineteenth-century taxonomies. Other scrapbooks are the products of sea-side holidays. Seaweed samples in these collections might be annotated with their location and date of gathering; the resort town of Torquay in Devon frequently appears in these captions. Especially in those private albums where seaweeds are holiday souvenirs, it is not uncommon to find the following as a motto: 'Call us not weeds, — we are flowers of the sea.'[2] For those interested in Victorian illustrations of plants, the stalls at the book fair might have for sale single coloured plates from issues of Curtis's *Botanical Magazine* and other periodicals.[3] These plates testify to the Victorian demand for accurate and pleasing coloured lithographs of plants that one might cultivate in one's garden. Natural history images also found their way into what we could call Victorian ephemera. The Flickr albums of various libraries and archives have brought to light Victorian Christmas cards featuring zoophytes, giant ants, and even dead birds.[4] While the latter may seem somewhat macabre for a holiday greeting, 'practical' taxidermy manuals from the period included instructions for making paper weights from stuffed newborn puppies mounted on marble slabs and for fashioning bell pulls from foxes' foot pads.[5] If the curious offerings at book fairs make us wonder about the practices and literature of Victorian natural history, few of us are probably aware that when we buy orchids at the grocery store or a glass 'home garden' (terrarium) at the hardware store, we are articulating a very Victorian desire to acquire and to contain natural objects.

This exhibition tells the story of the print culture that emerged from, and sustained, the Victorian appetite to encounter and to collect natural objects. We know from Lynn Barber, David Allen, and Lynn Merrill that different classes of natural phenomena (ferns, orchids, seaweeds, butter-

flies) attracted the natural history 'gaze' for a time and then receded from its view.[6] The term 'craze' has been used to characterize some of these changing tastes in natural objects.[7] The items in this exhibition, which include a botany book kept by a young woman from a famous Scottish family and an anonymous seaweed album with delicate gauffered edges, help to nuance some of these previous assessments of Victorian natural history. Taking a book-centred approach to how and why nineteenth-century individuals made collections of specimens and recorded their own natural history observations, this exhibition traces the interplay between print and manuscript culture. An interleaved copy of an illustrated work of ornithology and a printed treatise on conchology, in which an owner has 'tipped in' his or her own drawings, are evidence of the material ways in which readers used the books which told them about natural phenomena. A focus on the practices of Victorian natural history means paying attention to anonymous albums of specimens and to the marginalia in botany handbooks left by now untraceable readers. This exhibition understands provenance as not only an owner's inscription on the fly-leaf of a book but also a pressed flower preserved between a work's pages. While not eliding distinctions between 'professional' and 'amateur' botany, the exhibition brings to light print and manuscript items that do not fit neatly into these categories. The containers into which Victorians put objects of natural history (butterfly vivaria, Wardian cases, aquaria, fern cases) could be for the purposes of scientific observation, amusement, home decoration — or all three.

In the last two decades or so, scholars have sharpened our understanding of the contributions by women to the production of botanical knowledge in the nineteenth century.[8] Accordingly, this exhibition highlights the role of Victorian women as authors and illustrators of books of botany, and as authors of works on microscopy and algology. Publishers harnessed the potential of different techniques of illustration, including coloured wood engraving, lithography, and nature prints, and sent Victorians into the woods, across the fields, and down to the seashore. These readers, in turn, translated the fruits of their observations into bookish forms (albums, herbaria, scrapbooks of drawings) and into new published works of natural history. Taking its printed books from both ends of the spectrum, the exhibition displays 'shilling' natural history handbooks by Routledge, as well as an exceedingly rare illustrated work on orchids. The

Fisher Library's rich holdings permit us to reconstruct the print apparatus of Victorian natural history, while allowing us to glimpse how individual readers fashioned specimens and collections.

Chapter One: Plants and the Matter of the Victorian Book

In *Mary's Scrap Book* (1838), an example of juvenile Victorian natural history, little Mary learns from her mother the surprising truth that paper is made from the flax plant: 'How curious to think that such a nice useful thing as paper is, should be made of pieces of old rag, which are of no use to any body.'[1] For as long as paper continued to be fashioned from linen rags, until about the 1880s when the use of wood pulp paper became widespread, there existed an intrinsic connection between books and plants. This intimate relationship comes into even sharper focus when we consider the different genres and formats of botanical books published for an ever-expanding market during the nineteenth century. An examination of two nineteenth-century editions of *An Arrangement of British Plants* by William Withering (1741-1799) and of one adaptation of Withering's system to a pocket-sized volume demonstrates the ways in which published systems of classification guided readers as they headed out into the fields and the woods to make their own observations and collections of specimens. Such manuals instructed readers in the equipment they needed to gather and to preserve plants. Unique marks of provenance, interleaved specimens in one copy of Withering show how the Victorian book functioned as a 'container' in multiple ways. The 'bookishness' of Victorian natural history is apparent in the circular pattern by which readers consumed items of botanical print, made their own herbaria collections, and sometimes used printed works of botany to encase the objects of their own field work.[2] Delicate threads attach a family copy of Withering associated with Catharine Parr Traill (1802-1899) and Agnes Chamberlin (1833-1913), held by the Fisher Library, to their landmark publication *Canadian Wild Flowers* (1868).

William Withering's *Arrangement of British Plants* for Nineteenth-Century Readers

An Arrangement of British Plants (1776), by the physician William Withering, was just one of many botanical manuals available to nineteenth-century readers.[3] Written in English, his handbook helped to popularize the artificial system of plant identification developed by Carl Linnaeus (1707-1778). With its short, standardized Latin names based on a plant's

reproductive organs, Linnaeus's so-called sexual system could assist even novices in identifying plants by genus and species in the field.[4] The shifting formats of Withering's handbook during the nineteenth century attest to the strong appeal of its Linnaean method and to publishers' recognition that eighteenth-century titles, such as the *Natural History of Selborne* (1789) written by Gilbert White (1720-1793), could find new life during the Victorian period.[5] Before publishers brought out their one-volume editions in the 1830s, Withering's flora had swelled to a four-volume format in an effort to include the most recent botanical discoveries and refinements in nomenclature. The full title of the sixth edition, published in 1818, is *An Arrangement of British Plants: According to the Latest Improvements of the Linnaean System: With an Easy Introduction to the Study of Botany*. A list of names, which appears at the beginning of the first volume, acknowledges the contributions to this edition by such notable figures in botany as Adam Afzelius (1750-1837) and James Edward Smith (1759-1828). Withering's first volume sets out the Linnaean botanical tables of classification together with an explication of the parts of a plant. In some of his accounts of individual species, Withering traces, with reference to various periodicals and published works, how disputes have arisen about identification and where disagreements remain or have been resolved. He included in this volume directions for preparing a herbarium, a dictionary of botanical terms, and a set of rules for the pronunciation of Linnaean plant names. The third volume supplied readers with indices of the Latin and English plant names in the first two volumes, and the fourth volume tackled the still-vexed category of cryptogams or non-flowering plants (mosses, lichens, ferns, fungi, seaweed).

It is worth dwelling on Withering's instructions for assembling a herbarium because they capture so well the paper-heavy nature of this kind of collection and the technical expertise necessary to produce high-quality, well-preserved specimens. Withering begins by advising his reader to have a 'workman' fashion a screw press with iron plates to prevent against warping. For those readers who do not have access to such a press, 'specimens may be dried tolerably well between the leaves of a large folio book, laying other books upon it to give the necessary pressure.' After arranging for a screw press or a make-shift version, one must purchase sheets of pasteboard and a dozen quires of large 'spongy' (absorbent) paper. Withering recommends stationers' 'blossom blotting

paper' for the purpose. The optimal condition for gathering plants is 'a dry day, after the sun has exhaled the dew.' Like other botanists, Withering extolls the virtues of the vasculum for transporting plants. His preferred version is a nine-inch by four and a half-inch tin box with a hinged lid, 'painted, or lacquered' to guard against rust. In the case of the most delicate flower blossoms, stems should be immersed in water and the whole plant covered with 'glass bells' (cloches) from the garden or 'the receiver of an air-pump' until the specimens can be examined and readied for the herbarium. The next step in preserving specimens is to lay them on a sheet of pasteboard and then to cover this with eight to ten layers of the blotting paper before inserting the sheet into the press. What follows are several days of refreshing the blotting paper, '[rectifying] any mistakes' in the positioning of the specimen, and then, finally, removing the plant from the pasteboard. When the specimens are completely dry, Withering advises that glue, paste, or gum water (mixed with powdered arsenic or another substance noxious to insects) be used to fasten the specimen to a large sheet of folded writing paper. Acknowledging that 'some dexterity' is required, he cautions readers that none of the adhesive should bleed beyond the edges of the specimen. After pressing this sheet for another day or so, it is time for one to write the name of the plant on the sheet, as well as information about the location and the date of gathering. On the back of the sheet, only the name of the plant needs to be set down. The folded specimen sheets should then be housed in a cabinet. Withering provides the following less labour-intensive alternatives for preserving specimens: simply putting them loose between sheets of writing paper or fastening them with slips of paper pasted to the sheets. Sewing them down with fine thread is another means by which to attach them to the paper. For the particularly confident collector, he includes an account of how to *iron* one's specimens in order to dry and then fasten them to paper.[6] He emphasizes that plants should be gathered with a view to how they represent 'their Generic and Specific characters'; specimens should be mounted with the same aim in mind. If the root or the flower of a plant distinguishes it from another species, these parts must be displayed on the sheet.[7]

Inasmuch as Withering's manual popularized Linnaean taxonomy, one can see from his directions in the 1818 edition that the gathering of specimens and their preservation in the herbarium depended on one's

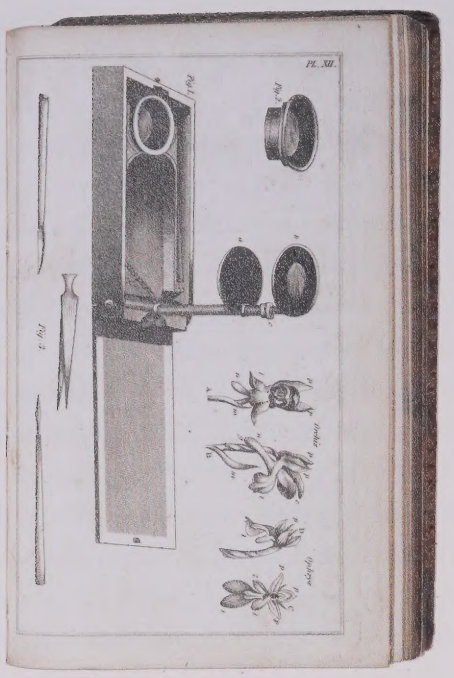


Fig. 1.
Botanical microscope, William Withering, *An Arrangement of British Plants*, 1818.

having the proper equipment. Tasks must also be performed to exacting standards in order for botanical knowledge to be increased. In addition to a vasculum, Withering's reader was urged to purchase the botanical microscope invented by the author. The 1818 edition carried an advertisement in the first volume for Withering's microscope, 'more portable and convenient than any other,' and available from the optician Mr. Beilby in Bristol and from the edition's publishers and other booksellers. Plate twelve of the first volume depicts this kind of microscope, of 'a shape and size conveninent to carry it in the pocket,' and details how to use its magnifying glass and dissecting knife (Fig. 1).[8] Taken together, the references to a workman constructing one's plant press, to the reams of paper necessary to dry and to create herbarium sheets, to the glass domes and air pump receivers that could be used to cover fragile plants, and to the purpose-built cabinet in which to store these sheets, make clear that Withering's audience, at least in 1818, was still at the upper end of the social spectrum.[9] Although scantily illustrated, the four-volume format of this edition of Withering would have made it among the more expensive of botanical reference works on the market at the time.

At the beginning of the nineteenth century, publishers recognized

Fig. 2.
Title page vignette, William Mavor, *The Lady's and Gentleman's Botanical Pocket Book*, 1800.

that Withering's Linnaean manual could be adapted to wider audiences. Hardly portable at four volumes, the current nineteenth-century format of Withering meant that the work was more likely to be kept in one's library rather than taken into the field. In July 1800, there appeared an advertisement for a pocket version of Withering by William Mavor (1758-1837). Mavor's *Lady's and Gentleman's Botanical Pocket Book; adapted to William Withering's Arrangement of British Plants* (1800) was priced at '3s in boards.'[10] The preface sets out Mavor's rationale for stripping Withering's local flora down to its essentials. His language carefully links the pursuit of botany with 'polite' accomplishment and civility: 'There are few studies more cultivated at present by persons of taste, than Botany.' Not only is the study of botany edifying, but it is also 'conducive to health and innocent amusement.' Botany, Mavor declares, 'ought to rank very high in the scale of elegant acquirements.'[11] The hand-coloured engraved vignette on the title page shows a fashionable couple to whom the Goddess of Flora is 'dispensing her flowers'; a cherub attends the scene (Fig. 2). Opposite the title page is a series of engravings of plants in Linnaeus's classes, thus reinforcing the ties between botanical knowledge and refinement. Just seventeen centimetres in length, Mavor's work omits

Withering's lengthy descriptions of plants and their parts, as well as the class of cryptogams. Instead, in Mavor's 'novel attempt to render botany still more fashionable,' only the names of plants, arranged in classes, orders, genera, and species appear. With 'the declared and obvious intention of the Botanical Pocket-Book' as that of 'merely [serving] as a record of what plants each person in his researches has had an opportunity of discovering and examining,' the convenient format of Mavor's Withering invited readers explicitly, through the large blank spaces left beneath each of the species on the page, to document their botanical excursions.[12] At the end of each class of plants, Mavor has also left blank an entire page for readers' 'remarks.' That at least some readers did, indeed, take up Mavor's call for them to actively engage with the text is evident in the Fisher Library's lightly annotated copy of Mavor; there an owner has made brief notes on the speedwell, valerian, milkwort, and other species.[13] Mavor's pocket version of Withering, more affordable and portable than the multi-volume edition that was currently on the market, exemplifies how publishers, at the beginning of the nineteenth century, exploited a market for fashionable botanical handbooks aimed at novices exploring the English countryside.

It was not until a one-volume edition, brought out in 1830 by William MacGillivray (1796-1852), that Withering's manual realized its full potential as a field guide for beginners. Entitled *A Systematic Arrangement of British Plants by W. Withering*, MacGillivray's popular abridgement of Withering passed through fourteen editions from 1830 to 1877.[14] The plates were now placed at the beginning of the text for easy reference and, as in Mavor, the majority of the cryptogams were dispensed with. When MacGillivray's third edition appeared in 1835, its cloth-bound version was priced at 10s, 6d.[15] Positioning their edition as suitable for female and juvenile readers, the publishers have sought to 'simplify' the 'interesting study of botany' and to 'bring it within the circle of PRIVATE and DOMESTIC EDUCATION."[16] In the advertisement to the second edition (re-printed in the third), we find the typical Victorian alignment of botany with devotional and educational imperatives. The work's aim is 'to induce the young to betake themselves, when the occasion offers, to the fields and woods, the mountains and shores, there to examine for themselves the rich profusion of Nature, and instead of vaguely admiring the diversified scenery of a district, to be able to mark its individual and min-

utest features.'[17] The passive wonder of the tourist is to be eschewed in favour of active inquiry and the classification of nature. Without naming Withering, MacGillivray notes that many previous manuals, although ostensibly for novices, assume quite an extensive knowledge of botany. By contrast, MacGillivray's work will provide the 'elementary knowledge' necessary for the reader 'to discover the name of a plant.'[18]

The equipment required for examining a plant in MacGillivray is also more modest than Withering's botanical microscope: a sharp-pointed penknife or a pin, and a small lens will suffice for peering into a specimen's constitutive parts.[19] Like Withering, MacGillivray recommends the use of a vasculum during botanical expeditions. The paper-heavy nature of the herbarium (here sixteen quires of smooth large paper) and the labourious process of drying the plants, however, cannot be avoided by the serious student. MacGillivray furnishes directions for the drying procedure of twelve specimens at a time. Care should be taken to pull up the roots of a plant, if the whole is smaller than the size of one's paper; otherwise, only the flowers should be collected. As in Withering, MacGillivray details the fashioning of a plant press; the latter's model is made from boards and iron weights or bricks. A dried plant will be affixed to a sheet of fine cut paper using slips of paper coated in isinglass or dissolved gum. Three slips laid across a plant's stem and branches in different places will usually suffice to secure the specimen to the sheet. At the top of the sheet, for each specimen, the species should be noted and at the bottom, its place of gathering. In this manner, fasiculi of five or six sheets, stitched in coloured covers, are constructed for each species. Ten fasciculi are gathered into a bundle and covered with pieces of pasteboard tied with string; a cabinet or chest houses the bundles. While this is the 'orderly' means of constructing an herbarium, MacGillivray allows for readers without such time, means, and skills: 'most plants dry sufficiently well between the leaves of old books, and many collectors save themselves the trouble of forming a neat collection, by huddling up their specimens in the least expensive or laborious manner.' At minimum, specimens can be kept loose in sheets of paper.[20] It should be clear that Withering's manual, in its various nineteenth-century editions and formats, encouraged readers to produce their own books of plants.

Fig. 3.
Plant specimens,
Alexander Thomson,
Herbarium, 1823.

Putting Plants on the Page

An expertly made herbarium by Alexander Thomson (circa 1800), assembled in 1823, gives us an idea of how some readers put into practice Withering's system. Entitled, 'Hortus Conservatio, or Garden Preservation of Plants Indigenous and Exotic,' Thomson's herbarium is a bound volume of more than two-hundred mounted specimens.[21] On ruled pages, specimens are arranged in twenty-four classes which correspond to Withering's Linnaean system. Specimens for the twelfth class of *Icosandria* (twenty or more stamens) and its fifth order *Polygynia* (many pistils) are affixed to the page with an adhesive, such as gum arabic, and in

Fig. 4.
Seaweeds mounted on card, Alexander Thomson, Herbarium, 1823.

some instances with paper slips (Fig. 3). Thomson was diligent in numbering each specimen and then providing, in the right-hand margin of the page, its Latin name, place of gathering, and month of flowering. The specimens from the twelfth class point to the global reach of Thomson's herbarium. Specimens of *Potentilla fragarioides* and *Potentilla sericea* from Siberia, of *Potentilla floribundus* from North America, and of *Calycanthus floridus* from Carolina indicate that either Thomson travelled himself to gather such specimens or drew upon extensive social networks through which these specimens flowed. He may also have purchased the specimens from ships' captains or other travellers. Britain's imperial interests may have provided the context for some specimens (a violet from the

Fig. 5.
Fern specimens,
Alexander Thomson,
Herbarium, 1823.

West Indies, for example), while other specimens came from Virginia (*Rudbeckia angustifolia*), Chile (*Fuchsia*), the Pyrenees (*Ranunculus*), and a host of European countries.[22] That Thomson's *Potentilla* (cinquefoil) specimens still retain their vibrant colours today suggest that they were gathered on sunny days, as recommended by Withering, and that Thomson dried them according to the laborious procedures outlined in the latter's and other handbooks. Given that some of Thomson's specimens originated in far-flung locales, their fine state of preservation attests to their careful packaging and transport; they must have been kept away from the threats of damp and insects.[23] A sign of Thomson's botanical rigour is that he collects and labels specimens in the particularly

Fig. 6.
Zoophyte, Alexander Thomson, Herbarium, 1823.

troublesome class of crytogams (the subject of Withering's fourth volume). Thomson's herbarium represents, then, the work of a highly skilled 'amateur' botanist, to which Withering's handbook was aimed.

As technically proficient as Thomson's herbarium is, perhaps like many amateur botanists, he began its assembly enthusiastically but his interest in the project waned over time. Although he ruled and titled an additional thirty-nine leaves of the album, these lack any specimens. Still other leaves have been assigned a folio number and ruled, but not titled. This is not to say, however, that these and other blank leaves of the album do not feature any specimens. In fact, Thomson's herbarium acted as a container for a variety of annotated and unidentified specimens. Twenty-

Fig. 7.
Maple leaf, Alexander Thomson, Herbarium, 1823.

six specimens of seaweeds are mounted in cards (Fig. 4), fern specimens inhabit other pages (Fig. 5), a loose zoophyte is housed between the album's leaves (Fig. 6), and a maple-leaf is preserved between another (Fig. 7). It is difficult to determine, now, whether these loose specimens were collected by Thomson, one of his descendants, or by a later owner of the album. Withering did furnish readers with directions for the preservation of seaweeds, which required soaking in fresh water in order to remove salt; once treated, such specimens adhere to pages directly under pressure.[24] The unremarkable quality of the seaweed specimens, the different papers on which they are mounted, and their overall lack of identifying information point to a collector other than the meticulous

Fig. 8.
Mounted herbarium specimen in copy of Withering and MacGillivray, *A Systematic Arrangement of British Plants*, 1835.

Thomson. More than likely, the life of Thomson's album extended beyond his own; drawn into the album's orbit were all manner of natural history objects. Trailing loose and unidentified specimens, the untitled leaves of Thomson's album came to function as a textual version of a cabinet of curiosities — a repository for the specimens that he had not time to mount properly and for objects collected by other individuals.[25] In Thomson's album, then, we encounter both ends of the herbarium-making spectrum. His carefully mounted plant specimens conform to Withering's highest standard, while the loose specimens recall Withering's minimum level of preservation (specimens pressed between the 'leaves of a large folio book') and MacGillivray's eminently practical 'huddling up' of specimens in books and sheets of paper.

If Mavor's readers filled in the blank spaces of his *Botanical Pocket-Book* with their own observations, and if some of Withering's readers, such as Thomson, produced accomplished herbaria in the form of albums, still other individuals exploited the physical space afforded by these manuals. The Fisher copy of MacGillivray's one-volume 1835 edition of Withering presents us with a particularly resonant example of how copies of Withering were put to use. Mounted directly to the pages of this copy are

a total of fifteen herbarium specimens (Fig. 8). When Withering and MacGillivray advised readers that, in the absence of a screw press, the pages of a book would suffice for drying and pressing specimens, they probably did not have in mind the leaves of their own publications. Heather Jackson has described marginalia as 'the product of an interaction between text and reader carried on—since books are durable objects—in the presence of silent witnesses.'[26] The mounted specimens in the Fisher copy of MacGillivray are material traces of these interactions between text and reader. Themselves durable objects, the specimens permit us to imagine the reader in space — taking his or her copy of MacGillivray into the woods and fields. Leah Price, in *How to Do Things with Books in Victorian Britain*, has pressed us to attend to the diverse ways in which books were 'handled' in the period. Non-verbal traces of use, she argues, must be integrated in our histories of the book.[27] The specimens that this reader has carefully sewn to the pages of Withering or, in some instances, affixed with tiny slips of paper, are resonant examples of 'non-verbal' traces of use. A skilled botanizer has handed down these complete and well-preserved specimens to future readers.

This copy of Withering also contains extensive marginalia in the traditional sense of manuscript notes on the page. In this case, in what seem to be at least two hands, readers' notes in ink and in pencil date from the 1830s to the 1860s. In the margins next to entries for certain species, a date and location is given, presumably when the individual came across the plant. Armed with his or her newly-published edition of MacGillivray, this reader encountered a number of species in Dover between 1835-1836: the stinking iris, the samphire at Shakespeare Cliff, and the common pellitory of the wall at Dover Castle. The individual observed orchids at Dover, Wingham, and Bromley — 'alot in 35.' For the squinancywort, seen at 'Castle Hill' (probably Castle Hill Road), Dover in 1835, some additional information about the environment is set down: 'frost plentiful.' Also in the south-east, the reader identified species at Canterbury and Tunbridge Wells. At Cambridge, the individual observed the feather-foil in June and, in Norwich, the wild snowdrop. Some of the locales are decidely urban, such as the Serpentine lake at Hyde Park in London; there, in July 1837, the reader saw the perennial, *amphibious persicaria*. At Nonsuch Park, this or another owner of the handbook came upon toadflax in 1854 and laid in a specimen on this page of MacGillivray's edition.

Fig. 9.
Mounted herbarium specimen in copy of Withering and MacGillivray, *A Systematic Arrangement of British Plants*, 1835.

While MacGillivray compressed Withering's expansive four volumes into one, one addition that MacGillivray made in his second edition of Withering was to include the flora of Ireland. Thus we see in the Fisher copy of Withering's 1835 edition references to slender mountain cotton-grass observed at the Giant's Causeway and impatiens at the botanic gardens in Belfast.[28] Intriguingly, another set of marginalia records species viewed at Wiesbaden, Germany. To take just one example, the traveller notes in the margins to the entry for the mountain pink, 'a beautiful variety crimson with white spots [,] about a foot high & other elevated situations near Wiesbaden.'[29] The provenance of this copy of MacGillivray is not confined to marginalia and laid-in specimens. Covering almost the entire page is a pencil drawing in the 'shape and size of a leaf' of the green musk orchid.[30]

Such traces of use extend the life of the book in more than one way. Published in 1835, this copy of MacGillivray reveals how it engaged its readers for at least the next three decades — that it served as a container for the specimens collected in the field. The empty space in the margins, and that at the head and foot of the page, functioned as a repository for the reader's memories of botanical excursions. Some of the mounted

specimens obscure lines on the printed page and thus point to the shifting function of the handbook (Fig. 9). Where the printed book once served as an authoritative guide for these excursions, it came to house the material forms of the owner's botanical knowledge. While MacGillivray provides information about the distribution of a species, the readers' manuscript notes offer a more evocative picture of individual plants and of the activity of Victorian botanizing. Great yellow loose-strife was observed 'in the fens' in Cambridge; great hairy willow-herb in the hop grounds.[31] In its references to species observed in Wiesbaden, this copy's marginalia extends the geographical range of the manual. We visualize the book travelling in space with the reader as he or she meets with Germany's flora. Because the traces of use in this copy of MacGillivray are anonymous, the usual distinctions between male and female readers, and between amateur and professional botany cannot be up-held. Even in the absence of identifying information about these readers, the make-shift herbarium created within the space of this copy and its trans-national marginalia transmit a vivid picture of Victorian botany in practice.

'Copied from Nature's Own Book': The Strickland Moodie Dunn Copy of Withering and the Making of *Canadian Wild Flowers*

> I have had enough —
> border-pinks, clove-pinks, wax-lilies,
> herbs, sweet-cress.
>
> O for some sharp swish of a branch —
> there is no scent of resin
> in this place,
> no taste of bark, of coarse weeds,
> aromatic, astringent —
> only border on border of scented pinks.
>
> -H. D., 'Sheltered Garden'

The year 1818 marked the unexpected death of Thomas Strickland (1758-1818), father of the authors Susanna Moodie (1803-1885) and Catharine Parr Traill (1802-1899). Only a decade earlier, Thomas Strick-

land had moved his family from Kent to Suffolk in order to take possession of Reydon Hall.[32] The Fisher copy of Withering's 1818 edition of *An Arrangement of British Plants* is from the family library of the Stricklands, the Moodies, and Alice Mary Dunn (1914-2011). Preserving plant specimens within its pages and bearing marginalia that points to its use by Moodie and Parr Traill's sister Elizabeth (Eliza) Strickland (1794-1875), this copy of Withering provides early evidence of the family interest in botany and field work. An obvious sign of this copy's heavy use is its battered state; boards have become detached in two volumes. Internal evidence that suggests Elizabeth Strickland annotated this copy includes a reader's note in volume one indicating what the plant *origanum* (oregano) is called in Suffolk.[33] More fulsome evidence that Strickland engaged closely and quite critically with this copy of Withering is a tipped-in note in the fourth volume dated 30 September 1868 about the fungi *Agaricus splendens*. Of this species, Strickland writes the following: 'Gathered in my garden at Tilford on a grassy slope shadowed by weeping Birch and fir tree, A beautiful mushroom...There is a clear wholesome looking curtain around the mushroom in its button just like any other button mushroom and this Withering does not mention. I am sure he has not seen the plant he describes.'[34] If this copy of Withering entered the Strickland household in 1818 at Reydon Hall in Suffolk, it likely followed Elizabeth to her cottage at Bayswater in London in the 1830s and, finally, in 1856, to her small villa, Abbot's Lodge, in Tilford, Surrey.[35] Given that this copy was held in the Strickland-Moodie-Dunn library until Alice Mary Dunn's death in 2011, when it was donated to the Fisher Library, it seems likely that the copy made the transatlantic voyage to Canada at some point.

The botanical expertise that Elizabeth Strickland acquired through her familiarity with Withering's handbook and botanical drawing manuals, and through her own observations in the fields and the woods of the English countryside emerges in Parr Traill's *The Backwoods of Canada; Being Letters from the Wife of an Emigrant Officer* (1836). In this volume, published for Charles Knight's 'Library of Entertaining Knowledge,' Parr Traill's excitement at encountering unfamiliar species of plants in Canada is tinged with her sadness at not cultivating her knowledge of botany earlier, under Elizabeth's guidance and aided by the gardens and library at Reydon Hall. As Parr Traill states in a well-known passage

from her published letter to Elizabeth dated July 1834, 'Deeply do I now regret having so idly neglected your kind offers while at home of instructing me in flower-painting...I daily lament that I cannot make faithful representations of the flowers of my adopted country, or understand as you would do their botanical arrangement.' With access only to a borrowed copy of *Flora Americae Septentrionalis* (1814), published by Frederick Pursh (1774-1820) in Latin, Parr Traill 'hardly [has] confidence in [her] scanty stock of knowledge to venture on scientific descriptions' of the plants she encounters.[36] Near the close of this letter, after Parr Traill has communicated detailed portraits of Canadian flora to her sister, Parr Traill again gestures to her inadequate botanical training: 'though it is very probable some of my descriptions may not be exactly in the technical language of the correct botanist, I have at least described them as they appear.'[37] Scholars have established that Parr Traill relied on the trope of modesty to position herself as an 'amateur' naturalist with no pretensions to scientific authorship.[38] In truth, her botanical knowledge was always deeper than she admitted, as were her contacts with other botanists.[39] Like Elizabeth, she was not afraid to correct or to augment published botanical authorities based on her own experience. Of an ornamental shrub that she transplanted to her garden, she writes in *Backwoods*: 'I do not find any description of this shrub in Pursh's Flora, but I know it to be a species of honeysuckle, from the class and order, the shape and colour of the leaves, the stalks, the trumpet-shaped blossom and the fruit.'[40] In the difficult class of cryptogams, she found Canadian ferns 'very elegant and numerous' and set about gathering specimens.[41] Parr Traill's research on ferns eventually found an audience in her well-received *Studies of Plant Life in Canada* (1885). For her discovery of a fern near Lakefield in a vacant lot — 'rearing its noble dark-green fronds among the broken piled up branches of a brush-heap' — Parr Traill received the honour of this species of *Aspidium marginale* being named 'Mrs. Traill's Shield Fern' by the Scottish-Canadian botanist George Lawson (1827-1895).[42]

We should not underestimate, though, the challenges confronting Parr Traill in Canada as she came 'late' to the study of botany. By 1834, Parr Traill had acquired enough of a local reputation for botanizing that 'a poor soldier' brings her a specimen of a 'curious aquatic plant.' From another 'gentleman, who knew my predilection for strange plants,' she receives a specimen of 'Pitcher plant.'[43] Still, Parr Traill thirsted for

printed works of botany (books and periodicals) and collecting equipment. Jim Endersby has explored the practical difficulties faced by nineteenth-century British travellers to the West Indies, Australia, and New Zealand who were charged with collecting botanical specimens for the Royal Gardens at Kew. All the items that Withering recommended for the gathering and preservation of plants (reams of paper, vascula, microscopes, and books) were perpetually in short supply.[44] Parr Traill's position in 1830s Canada, 'a country [which] opens a wide and fruitful field to the inquiries of the botanist,' was not tangibly different.[45] Even though she set about making herbaria for her sister Elizabeth and others soon after she arrived in Canada, it was not until almost thirty years later, in 1859, that she received a gift of a screw press from an elderly Lady Charlotte Greville (1775-1862) in England.[46] In *Backwoods*, she observes a 'curious plant' in the pine-wood near her homestead, whose anthers look like seeds. Parr Traill's remark that this 'singular flower would have borne examination with a microscope' leads one to believe that she was without such an instrument in the 1830s.[47] By the time the first edition of *Canadian Wild Flowers* appeared in 1868, she seems to have gained some access to this piece of equipment. Added to her account of the flowers of the red raspberry and their 'short bristly glandular hairs,' is the following: 'These appendages, seen by the aid of a powerful microscope, are objects of exquisite beauty, more admirable than rubies and diamonds.'[48]

If Parr Traill did, eventually, acquire some of the botanist's requisite equipment, the making of herbaria did not come easily — at least at first. *Backwoods* narrates Parr Traill's struggles with the preparation of herbarium specimens. Aquatic flowering plants present particular difficulties: 'I regret that among my dried plants I could not preserve any specimens of our superb water-lilies and irises; but they were too large and too juicy to dry well.' Parr Traill writes to Elizabeth of the rice plant, which, when in flower, has 'a beautiful appearance with its broad grassy leaves and light waving spikes.' Parr Traill gathers 'several spikes when only just opened, but the tiresome things fell to pieces directly [when] they became dry. Next summer I will make another attempt at preserving them.' Of the plant in the pine-wood that she wished to examine with a microscope, whose blossoms seemed strangely to bloom underground, Parr Traill collected a specimen 'but being dried became so brittle that it fell to pieces.' The specimens of the 'rare' *Viola tricolor*, which Parr Traill gathered from

the side of the road on a journey to Coburg, were not properly preserved and she has not had another opportunity to make this trip again.[49] Over time, Parr Traill became proficient at making herbaria such that, in a letter addressed to her friend Frances Stewart (1794-1872) from April 1853, Parr Traill offers these remarks on the prepartion of specimens: 'I am going to ask dear Kate as a great and especial favour, to try and get me specimens of the milk white violets that used to grown in the park about rotten logs — I find it sometimes a good plan to separate the flower from the leaves as they interfere in pressing — I can always restore them in putting them on paper...I find pressing between old fine cotton in a book better than paper it absorbs.'[50] In another letter to Stewart that year, Parr Traill again gestures towards her own growing botanical expertise: 'I have not been able to get a single specimen of rice for you or any one else — being so far from the lake no one goes on it — at the season of the rice flowering and none but a person who knew how to preserve it from injury could get it for me to be of any use for putting down on paper.'[51] Parr Traill has become skilled at preserving specimens of the plant whose spikes 'fell to pieces' in the 1830s; it is simply now distance and opportunity that prevent her from gathering and drying these specimens to a high standard.

As the years passed, Parr Traill continued to make herbaria for family members and also began to prepare such collections for commercial sale. During a difficult period in 1857, Parr Traill writes of letting the farm and '[earning] something in a quiet way by needle-work and knitting, pressing flowers and other matters.' The income from 'our Dried Plants,' she notes, will cover the cost of a woven carpet.[52] A five-dollar loan from the minister in Lakefield is repaid in May 1863 with income from Parr Traill's herbaria.[53] Not surprisingly, an increase in Parr Traill's commercial production of herbaria coincides roughly with the gift of the screw press from Lady Greville. As she tells Eleanor (Ellen) Stewart Dunlop (1819-1907), in a letter from May 1860, she has compiled one such collection for Ellen's mother (Frances) and 'the other two sets are for any of the ladies who wished for them. I hope they will not think the price too great, but they do cost me a great deal of time and close attention to gather press and put them down besides naming them which indeed is sometimes the most laborious past of the work, yet $5 does seem a great deal to give for wild plants, does it not?'[54] In the lines above, we detect Parr Traill's impatience at the notion that such collections do not require time and botan-

ical expertise. It is worth noting that the first edition of *Canadian Wild Flowers* was also priced at five dollars. One wonders if Parr Traill is wryly amused by the women who are willing to pay for objects growing in the Canadian wild. Parr Traill's skill at assembling herbaria led to her exhibiting such collections at competitions and becoming miffed, in October 1862, when her collection of ferns failed to win a prize at a provincial show.[55]

What emerges in Parr Traill's publications and correspondence is her participation in economies of exchange in which botanical specimens, seeds, and texts circulate as gifts, barter, and commodities. While, in the 1830s, Parr Traill was still developing her skills at preparing herbaria as family gifts, by the 1850s, such expertise meant that she could exploit the commercial market for such collections. Parr Traill's publications yielded other forms of botanical information and objects. James Vick of Rochester, manager of *Vick's Illustrated Monthly Magazine*, to which Parr Traill contributed, provides her in 1853 with discounted coloured numbers of *The Horticulturalist* (which were normally priced at four dollars).[56] Two decades later, we find Vick paying for her literary pieces in the form of seeds.[57] Parr Traill thus found ways to obtain botanical publications which she would otherwise have not been able to afford. The seeds that she acquired from Vick, when sown in her garden or those of her family members, would have expanded her sphere of botanical knowledge and fed her future publications.

Despite Parr Traill's notable skill at assembling herbaria, her sister Elizabeth's words about the limitations of this particular botanical genre must have remained lodged in her mind.[58] Regarding a species of flowering evergreen, Parr Traill writes the following in *Backwoods* to Elizabeth: 'I have never seen specimens of the flowers in bloom but twice; these I carefully preserved for you, but the dried plant will afford but an imperfect idea of the original. You always called, you know, your dried specimens corpses of plants, and said, that when well painted, their representations were far more like themselves.'[59] The value of herbarium specimens relative to an artist's rendering was a matter of some debate during the Victorian period. As Endersby explains, 'drawings could record details that were lost when drying specimens, but the activity of drawing was also a way of investigating nature: as botanists learned to draw they learned to look closely at the structure of the plant and to

understand the shape and structure of its parts.'[60] Even if vibrant colours and well-formed specimens could be produced by the artist, Anne Secord makes clear that some professional botanists during the nineteenth century expressed a mistrust of botanical illustration on the basis that these visual respresentations worked against the standardization of observation and elicited pleasure in their consumers.[61] It was not an accident, Endersby tells us, that the technical form of botanical illustration most relied upon by professional botanists by the mid nineteenth century were images resembling the herbarium specimen: a single species isolated on the white page without a background.[62]

If Parr Traill was disappointed in the 1830s that her dried herbarium 'corpses' could not capture adequately the beautiful but ephemeral blooming evergreen at Lakefield, she later identified other critical functions for botanical illustration. In September 1852, she addressed a pointed letter to the editor of the American agricultural periodical the *Genesee Farmer*. In lines that anticipate the publication of her and Agnes Chamberlin's volume *Canadian Wild Flowers* (1868), Parr Traill stakes out for botanical illustration linked ecological and nationalistic roles. She chides the editor for only '[recommending] to the attention of the daughters of your subscribers the cultivation of the flowers of the green-house and parterre.' In Parr Traill's opinion, he should 'be pleased to speak a few words in behalf of the natives of the soil — I mean the lovely Wild Flowers — but as regards their cultivation and their delineation on paper.' Registering the decline that Parr Traill has witnessed in Canadian flora since she arrived in the 1830s, she writes the following: 'I am a great admirer of the indigenous flowers of the forest, and it is with a feeling strongly allied to regret, that I see them fading away from the face of the earth. Many families, containing blossoms of the greatest beauty and fragrance are fast disappearing before the destructive agency of the chopper's axe, fire, and the plow.' Although she stops short of recognizing the role of settlement (including her own) in the decline of floral diversity, she seems to intuit a striking parallel between the loss of local flora and the 'aborigines of the country:' 'the place that knew them once, now knows them no more.' Returning to the subject of vanishing botanical species, she issues the stark pronouncement that 'Man has altered the face of the soil — the mighty giants of the forest are gone, and the lowly shrub, the lovely flower, the ferns and mosses, that flourished beneath their

shade, have departed with them.' In an elegiac passage, she wonders, 'where now are the lilies of the woods, the lovely and fragrant Pyrolas, the Blood-root, the delicate sweet scented Michella repens, the spotless Monotrope, with Orchis of many colours, and a thousand other lovely flowers?' Moving from the destruction of the forest by agriculture, forestry, and settlement, Parr Traill trains her gaze on North American botanical societies. These institutions have failed 'to preserve correct representations of these rare but evanescent beauties of the woods, by encouraging to any extent the pursuit of botanical flower painting among the amateur artists of the Colony.' While Pursh and the authors of other North American floras have published a few illustrations, more needs to be done to provide 'the correct delineation of form, or exact shade of color' of undocumented, quickly vanishing, species. Using a botanical metaphor, Parr Traill imagines the 'many young and accomplished females who have been transplanted to America' helping to undertake this work of a botanically accurate, illustrated 'Canadian Flora.' For Parr Traill, then, science and aesthetics could meet productively in botanical illustration to render plants 'as attractive' as possible 'thereby increasing their value.'[63]

With the publication of *Canadian Wild Flowers* in 1868, for which Parr Traill provided the textual descriptions — and her niece, Agnes Chamberlin, the lithographed plates — we find an articulation of Parr Traill's ecological and patriotic imperatives. Certainly, early reviewers aligned the publication with the post-Confederation appetite for Canadian books. As one reviewer wrote in the *Journal of Education*, this was 'a work that ought to awaken the enthusiasm and command the patronage of every well educated Canadian, who has at heart the prosperity of his rising country.' Without a hint of irony, the same reviewer continued, 'Let him recognize in this elegant volume, a symbol of [Canada's] future greatness, and hasten to secure a copy of the "Wild Flowers of Canada," before they disappear from his view with the receding forests.' Of the illustrations, the reviewer writes the following: 'They are so closely copied from the originals, designed and colored with such a masterly hand, that they seem to live and bloom upon the paper.' 'Think,' the reviewer urges the periodical's readers, 'of a pair of female hands, designing, lithographing and coloring 5000 plates for this book, each plate containing three or four specimens of flowers. It is enough to turn one's locks grey

the thought of such an herculean labor.' This review takes the mammoth *Birds of America* (1827-1838), published by James J. Audubon (1785-1851), as the aspirational model and hopes that *Canadian Wild Flowers* 'is but the first volume' in such an authoritative and pioneering series. The natural history professor William Hincks (1794-1871), at the University of Toronto's University College, is quoted within the review to issue *Canadian Wild Flowers* with a scientific stamp of approval.[64] Careful not to relegate the book to the dusty shelves of universities, the reviewer asserts that 'the volume will form an elegant addition to our libraries, and the ornamental books that grace our drawing room tables.' Sprinkled with poetic extracts from Shakespeare, Robert Herrick, Thomas Gray, and Felicia Hemans, and espousing the natural theology so characteristic of Victorian botany, Parr Traill's volume can be aligned with other publications meant for the Victorian parlour. Indeed, in her account of the speedwell, whose blossoms 'are said to mean undying love, or constancy,' Parr Traill evokes the sentimental flower books which partook in the 'language of flowers.'[65]

Published by subscription and priced at the then substantial sum of five dollars, *Canadian Wild Flowers* went on to four editions in four decades. While the first edition, brought out by John Lovell in Montreal, appeared with an uncoloured title-page, in the second edition (1869), the lithographed title-page is hand-coloured. Framing the book's title and authors' names is an arbour of entwined branches trailing somewhat stylized examples of cinquefoil, violets and Spring Beauty. This arbour design recalls other botanical works from the Victorian period such as *Illustrations of Himalayan Plants* (1855) by Joseph Dalton Hooker (1817-1911) which integrate the subject matter of the publication into title-page design. By the second edition, the price of *Canadian Wild Flowers* had risen to six dollars. Parr Traill worried that some copies had already gone to press before corrections that she had made to the text could be incorporated and that these would appear as a list of errata. She cheered herself, albeit wryly, by remarking to Frances Stewart, 'I was much disappointed in my share of the work which I feel is open to criticism fortunately the plates will redeem it in the eyes of a great many persons who would hardly care for the reading part of the book.'[66] The botanical plates are indeed visually arresting. Flowers were arranged not according to any taxonomical system. Rather, they were grouped by the season in which

one might meet them in the forest. In this respect, *Canadian Wild Flowers* resembled the botanical genre of florilegia and other works of horticulture in which plates were designed with aesthetic qualities in mind. There were practical reasons for grouping multiple species in one plate. Chamberlin, a new widow, and her associates, were undertaking all the lithographic work, including the hand-colouring of ten plates for each of five hundred copies, themselves. Plates composed in the style of florilegia thus reduced the labour and publishing costs.[67] If the groupings in the plates of *Canadian Wild Flowers*, at first glance, appear 'unscientific,' when we look at Chamberlin's original watercolours of individual species, single specimens with roots on a white page, which served as the basis for her groupings in the plates of *Canadian Wild Flowers*, we see something much closer to the scientific, herbarium-style images that Endersby associates with professional Victorian botany.[68]

A little-discussed episode in the publication history of *Canadian Wild Flowers* takes us further into the contested territory of Victorian botanical illustration. In 1895, the Toronto publisher William Briggs brought out a numbered fourth edition of Parr Traill and Chamberlin's volume.[69] In addition to the set of copies that were again hand-coloured by Chamberlin, Briggs sold a limited-edition 'colourist's' copy of the 1895 edition.[70] Plates in this edition were sold uncoloured, along with instruction slips tipped in at each plate to indicate which colours should be used by the colourist. As the edition seems to have been sold privately by Briggs from Lakefield, it is difficult to determine now its price.[71] The colourist's edition may simply have been a means by which Briggs could sell additional copies of the fourth edition at a low production cost. It is possible that colouring slips had already been printed to assist Chamberlin and her associates in hand-colouring the plates of the regular fourth edition. By selling copies that readers might, themselves, colour, Briggs implicated his publication in the nineteenth-century genre of botanical drawing manuals. It is here that the colourist's issue of the fourth edition of *Canadian Wild Flowers* converges unexpectedly with both Parr Traill's longstanding regret that she did not acquire skills in botanical illustration and her spirited letter to the editor of the *Genesee Farmer* calling upon botanical societies to train their members up in flower painting. During the nineteenth century, copying and colouring were judged proper methods for training a botanist.[72] As a form of polite accomplishment for

Fig. 10.
Plate from fourth edition of Agnes Chamberlin and Catharine Parr Traill, *Canadian Wild Flowers*, 1895. Plate hand-coloured by Chamberlin.

women, flower painting manuals and botanical copybooks came onto the market. The latter genre contained plants in outline, often with models, to be 'tinted in' by the reader.[73] In an ironic way, then, this colourist's issue of *Canadian Wild Flowers* might have prompted a set of readers to gain some skills associated with botanical illustration. Looking closely at plate VI in a copy of the fourth edition, hand-coloured by Chamberlin (Fig. 10) and at the same plate, 'tinted in,' in the colourist's issue (Fig. 11), one can see the variablity in the colour of the iris and in the shading of the ladys-lipper. With directions to colour the lady's slipper 'a dull orange,' the iris, 'dark blue, with veins of rich purple' with 'a slight tinge of yellow on the throat,' and the small cranberry, 'delicate pink,' one can see why, on the

Fig. 11.
Plate from fourth edition (colourist's issue) of Agnes Chamberlin and Catharine Parr Traill, *Canadian Wild Flowers*. 1895. Plate 'tinted in' by owner.

page, these remain mutable specimens. One wonders if copies of the colourist's issue of *Canadian Wild Flowers* performed, albeit belatedly, the documentary and preservationist function that Parr Traill had imagined for botanical illustration — that of encouraging the young women of the colony to attend to the 'botanical structure, form, and colour' of their local flora.[74]

At its heart, *Canadian Wild Flowers* strives to make visible native species that seemed, at the time, unremarkable in comparison to those cultivated in greenhouses and conservatories. Chamberlin's botanical lithographs, 'Copied from NATURE'S OWN BOOK,' are paired with Parr Traill's narratives of uncovering these elegant local species.[75] As

Kristina Huneault argues in regard to nineteenth-century women practitioners of botany in Canada, including Parr Traill, first-hand encounters shaped their expressions of botanical knowledge.[76] In Parr Traill's account of the 'showy orchis,' we follow the botanical adventurer as she descends into the boggy backwoods to emerge triumphant with her botanical prize: 'Deep hidden in the damp recesses of the leafy woods, many a rare and precious flower of the Orchis family blooms, flourishes, and decays, unseen by the human eye, unsought by the human hand, until some curious, flower-loving botanist plunges amid the rank, tangled vegetation and brings beauties to the light.'[77] To Parr Traill, the unfolded buds of the *Cypripedium spectabile* (showy lady's slipper) have 'the appearance of slightly flattened globes of delicately-tinted primrose coloured rice-paper.' The fragile, papery buds of the lady slipper — their need for protection — lead Parr Traill to utter one of the most elegiac passages in *Canadian Wild Flowers*: 'A time will come when these rare productions of our soil will disappear from among us, and can be found only on those waste and desolate places where the foot of civilized man can hardly penetrate.'[78] *Studies of Plant Life in Canada* (1885) had included Parr Traill's call for the establishment of a national botanical garden in Canada 'where collections of the most remarkable of our native plants might be cultivated and rescued from oblivion.'[79] Five years before her death, in *Pearls and Pebbles; or, Notes of an Old Naturalist* (1894), Parr Traill was forced to confront the irreversible devastation to the Canadian landscape that had occurred since her arrival in the 1830s: 'There is a change in this country; many of the plants and birds and wild creatures, common once, have disappeared entirely before the march of civilization. As the woods which shelter them are cleared away, they retire to the lonely forest haunts still left, where they may remain unmolested and unseen till again driven back by the advance of man upon the scene.'[80] It is some consolation that examples of the herbaria that Parr Traill assembled in the mid nineteenth century and the over two hundred watercolours of individual wild flowers that Chamberlin painted are preserved in the Fisher Library and other collections — the material remains of Canada's lost biodiversity.

Chapter Two: Paper Birds

When Catharine Parr Traill published *Studies of Plant Life* in 1885, she hoped the work would 'become a household book, as Gilbert White's Natural History of Selborne is to this day among English readers.' After emigrating from England, her 'home longings' included that country's signs of spring: 'when the hedges put out their green buds and the Violets scent the air; when pale Primroses and the gay starry Celandine gladden the eye.' She soon found solace, though, in 'Canadian forest flowers, and trees and shrubs, and the lovely ferns and mosses.' *Studies of Plant Life* communicated these local 'natural beauties' to 'other lonely hearts.'[1] Some scholars have cited Parr Traill's self-conscious alignment with White's tradition of field natural history, near the close of the nineteenth century, as a mark of her antiquated approach to botany.[2] If, by some measures, Parr Traill's adherence to White seems retrograde, she was certainly correct that his *Natural History of Selborne* remained, at that time, a best-seller in England. At precisely the moment that her *Studies of Plant Life* came onto the Canadian market, White's volume, first published in 1789, was passing through yet another of its Victorian editions.[3] Nineteenth-century editions of White's *Natural History* dovetailed with the spate of works of popular ornithology reaching the Victorian market. In 1849, for example, Philip Henry Gosse (1810-1888) had published an illustrated ornithological calendar in the series of relatively affordable natural history books published by Lovell Reeve (1814-1865). The appetite for illustrated works of ornithology was whetted by the elegant wood engravings in the *History of British Birds* published by Thomas Bewick (1753-1828). His volume on land birds came out in 1797, followed by one on water birds in 1804. Like White's *Natural History*, Bewick's *British Birds* continued to be published in new editions in the Victorian period. An eighth edition printed from Bewick's original wood blocks appeared in 1847.[4] An extensive collection of the editions of White's *Natural History*, assembled by the Fisher Library's long-time, former director Richard Landon, permits us to chart the book's strong appeal to Victorian readers. How one reader practised a version of White's field natural history emerges in a unique item held by the Fisher Library: an interleaved copy of Bewick's *British Birds* owned by the Yorkshire naturalist and, later, Canadian politician Charles Fothergill (1782-1840).

Why might Parr Traill have felt such an affinity for White's natural history? To use White's own language, both writers practised an 'active and inquisitive' mode of natural history characteristic of 'those that reside much in the country.' For White, 'faunists' in their 'studies' could offer only 'bare descriptions.'[5] Born of their inquiries in the field were White and Parr Traill's respective observations on pollinators and on the effects of forest fires on their local ecologies. Both writers found ferns and wild grasses curious, and documented the uses of wild plants. The notion of providence shaped White and Parr Traill's conceptions of the natural world, and the epic *Paradise Lost* (1667) by John Milton (1608-1674) served as a touchstone for both writers. Threaded through the natural history works of White and Parr Traill are Milton's verses.

The connections between White and Parr Traill are, perhaps, most visible in their shared interest in ornithology. One of the letters in *Backwoods* preserves Parr Traill's ornithological observations from the 1830s including her account of the cardinal, the Canadian robin, the snow-bunting, and the blue-bird. Of the blackbird's song, she writes the following: 'They have a peculiarly melancholy call-note at times, which sounds exactly like the sudden twang of the harp-string, vibrating for a second or two on the ear. This, I am inclined to think, they use to collect their distant comrades, as I have never observed it when they were all in full assembly, but when a few were sitting in some tree near the lake's edge.'[6] The anthropomorphism that one detects in Parr Traill's accounts of birds, as well as her obvious affection for these creatures, are in keeping White's approach in *Natural History of Selborne*.[7]

White set the standard for the patient observation of birds in their habitats. Decades of bird-watching in Selborne enabled him to chart various species' migration patterns, methods of nidification, mating habits, and song: the titmouse at the beginning of February '[makes] two quaint notes, like the whetting of a saw' and red-breasts are called 'autumn songsters' only because their notes are drowned out by 'the general chorus' in the spring and summer. Nightingales, at the birth of their offspring, 'make a plaintive and a jarring noise.' When calm, black-caps will '[pour] forth very sweet, but inward melody.'[8] With its emphasis on local knowl-

edge and first-hand experience, White's *Natural History* became implicated in a growing divide between field or 'outdoor' naturalists and so-called 'closet' naturalists.[9] The 'field versus closet' naturalist debate played out, in the nineteenth century, most vigorously in the realm of ornithology. The cause of field naturalists was bolstered by White's model of what was known as 'parish natural history.' Only through sustained observation in Selborne was he able, for example, to identify three separate species of willow wren (the willow warbler, wood warbler, and chiff-chaff).[10] Working exclusively from textual authorities and dead specimens, 'faunists' or closet naturalists were doomed to err as they generated taxonomies.

A review from 1831 in *Blackwood's Magazine* testifies that White's *Natural History* sold 'by the thousands' and Susan Bruxvoort Lipscomb puts at more than a hundred the number of editions of White's work that appeared between 1830 and 1900.[11] When the *Natural History* was first published by White's brother's London firm in 1789, it was a relatively unassuming work. The title-page did not bear the author's name. Priced at one guinea, a folding view of Selborne was tipped in opposite the title page and a handful of engravings by Samuel Hieronymous Grimm (1733-1794) appeared in the edition. Over time, editions of the *Natural History* became more elaborate as they incoporated biographical information about White, extracts from his poetry, material from his manuscripts and correspondence, maps, diagrams, tables of weather observations, and additional illustrations.

Two nineteenth-century bindings of White's *Natural History* are worthy of notice. The cover design for the 1860 edition that John George Wood (1827-1889) published with Routledge depicts the naturalist's study as though enclosed in a bower. Blocked in gold on cloth (red or blue) and signed J.L. for the book designer John Leighton (1822-1912), the cover shows a desk with an écritoire with quill and a vase of flowers. A cloak is draped over the chair, where rests a tricorne. The scene is a domestic one, with a cat perched on the top of the desk and a dog laying underneath on the floor. A walking stick or possibly a geologist's hammer is balanced delicately against the chair. A mouse and a turtle sit on one of the curving branches that frame the study; White's observations of a tortoise appeared in the *Natural History*. Two butterflies hover by the bower's tendrils, from which a caged bird is suspended. If White positioned himself

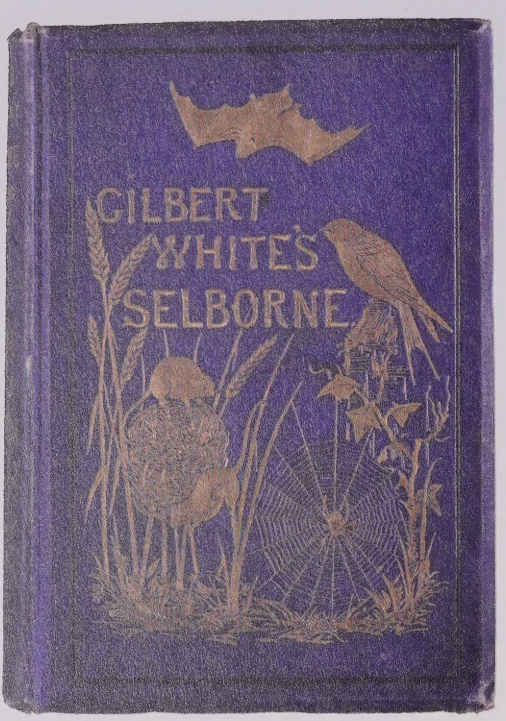


Fig. 12.
Cover of Gilbert White, *Natural History of Selborne*, 1888.

squarely on the side of the field naturalist, such concerns were not germane to Leighton. His quaint scene implies that the field naturalist is out on a walk, while his companions wait patiently in his study. Whatever observations issue from his walk will be scrutinized in this comfortable scholarly setting.

A charming poem that White composed for Thomas Pennant (1726-1798), 'The Naturalists' Summer Evening Walk,' inserted in the *Natural History* after Letter XXIV, helps us to imagine the activities of Leighton's absent naturalist. Indebted to the *Georgics* by the Roman poet Virgil and to Milton's *Paradise Lost*, White's poem follows the naturalist as he '[steals] adown the vale' and observes creatures as 'all the fading landscape sinks in night.' 'A soothing melancholy joy' comes over him 'to see the feeding bat glance through the wood; / To catch the distant falling of the flood; / While o'er the cliff the awaken'd churn-owl hung / Through the still gloom protracts his chattering song.'[12] The cover design for the 1888 edition of the *Natural History*, published by the ornithologist James Edmund Harting (1841-1928), brings into focus some of the creatures present in the 'still gloom' of the naturalist's nocturnal expedition (Fig. 12). The design, which was blocked in gold on cloth, nods to both stock

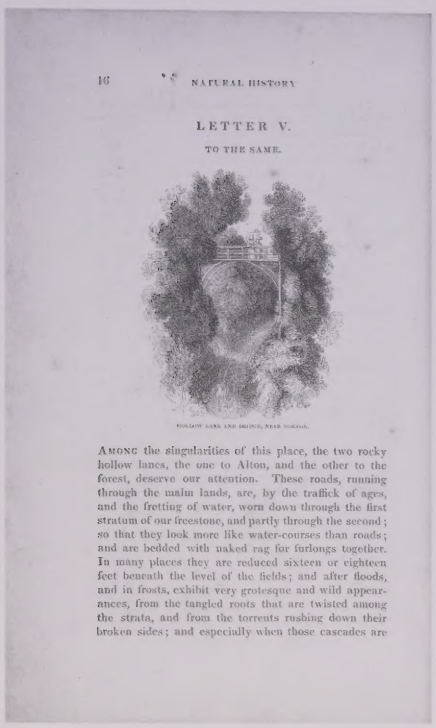
woodland creatures and their darker counterparts — bats and spiders. In a style popular during the Victorian period, the letters of 'Gilbert White's Selborne' resemble twigs; a bat hovers above the title. Visible on the spine are a barn owl, another bat, and a snail nestled in the brush. Bats figure prominently in the *Natural History*; White describes how they 'drink on the wing, like swallows, as they play over pools and streams.' Once, he met a tame bat whom he fed by hand.[13] White was famous for first identifying the harvest mouse in 1767 in Selborne; it is perhaps this creature with its nest that is represented among sheaves of wheat on the cover. As White explains in the *Natural History*, harvest mice 'build their nests amidst the straws of the corn above the ground, and sometimes in thistles. They breed as many as eight at a litter, in a little round nest composed of the blades of grass or wheat.'[14] The design for the cover, which also appeared in red and green cloth, takes some liberties with scale such that the spider's web is exceedingly large — as though seen through a magnifying glass. If the scene has a domestic cast, it is by showing the intricacy of the web's design and the careful construction of the other creatures' abodes.

Comprising the *Natural History* are two series of artfully arranged and edited letters addressed to fellow naturalists Pennant and Daines Barrington (1727-1800) on the flora and fauna of Selborne. White's epistolary format drew inspiration from the novel *Pamela* (1740-41) by Samuel Richardson (1689-1761), as well as from the scientific letters that made up the Royal Society's periodical, The *Philosophical Transactions* (1665-). The epistolary exchanges of the naturalist John Ray (1627-1705) had been published in 1718 and provided another literary precedent.[15] While the *Natural History* supplies readers with only White's side of his exchanges with Pennant and Barrington, a conversational frame is maintained by White's acknowledging receipt of specific letters and by responding to queries posed by his correspondents. He addressed the following lines to Barrington, for example: '[I] am pleased to find that you read my little history of the swallow with your usual candour; nor was I the less pleased to find that you made objections where you saw reason.'[16]

One of White's stated aims in the *Natural History* was to 'induce' readers 'to pay a more ready attention to the wonders of the Creation, too frequently overlooked as common occurences.'[17] For Victorian readers, who expected their natural history publications to espouse the tenets of natural theology, White's vision of an endlessly curious natural world had

strong appeal: 'I find, in zoology as it is in botany: all nature is so full, that that district produces the greatest variety which is the most examined."[18] The *Natural History* provided readers with a portrait of the disciplined parson-naturalist at work. We learn that, 'for many months,' White 'carried a list in my pocket of the birds that were to be remarked, and, as I rode or walked about my business, I noted each day the continuance or omission of each bird's song."[19] In 1767, White was given a copy of Barrington's *The Naturalist's Journal*; this was a set of blank printed forms for recording the natural phenomena that one observed each week. These records furnished observations for the *Natural History*. As early as the second edition of White's work (1802), publishers culled material from the author's journals and reproduced these observations as 'The Naturalist's Calendar.' Later editions, such as one from 1876, even provide readers with a fold-out page in facsimile from White's copy of Barrington's journal; this shows the former's weekly observations of weather, rainfall, the flowering of trees, and the appearance of birds.[20] In not so subtle ways, then, did nineteenth-century editions of White's *Natural History* encourage readers to compile their own records. The rigour required to make weekly observations of the natural world was in tune with the Christian emphasis on spiritual discipline and education. Not surprisingly, an illustrated and abridged version of White's *Natural History*, 'Arranged for Young Persons,' was published in 1833 and distributed by the Society for Promoting Christian Knowledge. In order to make the *Natural History* a wholly pious text, though, it was thought necessary to excise from the SPCK's edition White's fulsome accounts of the copulation of swallows, tortoises, worms, and toads.

In the precision of its natural history observations and imaginative scope, White's *Natural History* has affinities with the botanical sonnets of Charlotte Smith (1749-1806) and with the rural poetry of John Clare (1793-1864). From the beginning, it was the more rustic and romantic elements of White's *Natural History* that were the subject of illustrations. The first edition presented a title-page vignette designed by Grimm entitled, 'Where the Hermit hangs his straw-clad cell.' This phrase derives from one of White's poems, 'The Invitation to Selborne,' which was printed in full in the 1802 edition of the *Natural History*. The oval engraving of the hermitage is linked to a scene in the *Natural History* in which White and his neighbours, in a mock hermit's cell on Selborne Hanger, were visited



16 NATURAL HISTORY

LETTER V.

TO THE SAME.

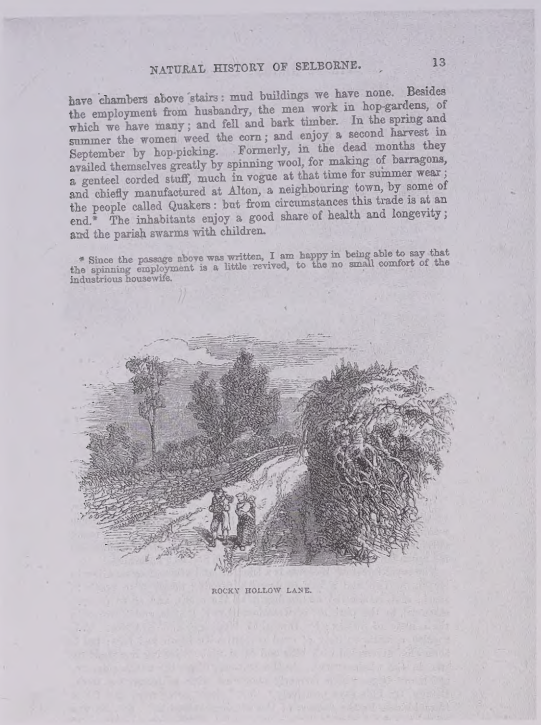
HOLLOW LANE AND BRIDGE, NEAR SELBORNE.

AMONG the singularities of this place, the two rocky hollow lanes, the one to Alton, and the other to the forest, deserve our attention. These roads, running through the main lands, are, by the traffick of ages, and the fretting of water, worn down through the first stratum of our freestone, and partly through the second; so that they look more like water-courses than roads; and are bedded with naked rag for furlongs together. In many places they are reduced sixteen or eighteen feet beneath the level of the fields; and after floods, and in frosts, exhibit very grotesque and wild appearances, from the tangled roots that are twisted among the strata, and from the torrents rushing down their broken sides; and especially when those cascades are

Fig. 13.
Hollow Lane and Bridge, Gilbert White, *Natural History of Selborne*, 1837.

by a churn-owl.[21] Nineteenth-century readers with a taste for the gothic, reared on the frozen landscapes of *Frankenstein* (1818) by Mary Shelley (1797-1851), would also have found material in White for their imaginations. After floods and frosts, writes White, the rocky hollow lanes which run to Alton and to Wolmer Forest 'exhibit very grotesque and wild appearances, from the tangled roots that are twisted among the strata, and from the torrents rushing down their broken sides; and especially when those cascades are frozen into icicles, hanging in all the fanciful shapes of frost-work.' The naturalist embraces the sublime elements of the landscape and is cast as an adventurer: 'These rugged gloomy scenes affright the ladies when they peep down into them from the paths above, and make timid horsemen shudder when they ride along them; but delight the naturalist with their various botany, and particularly with their curious *Filices* with which they abound.'[22] Even though Selborne was only about fifty miles from London, the hollow lanes were one of its ancient topographical features which, in the eighteenth century and in poor weather, made it remote and even inaccessible.[23]

The ways in which this particular letter to Pennant was illustrated in various nineteenth-century editions of White reveal shifting sensibilities



NATURAL HISTORY OF SELBORNE. 13

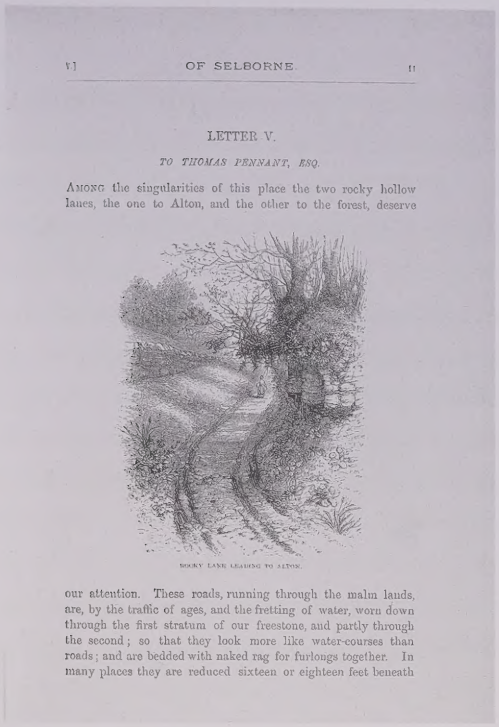
have chambers above stairs: mud buildings we have none. Besides the employment from husbandry, the men work in hop-gardens, of which we have many; and fell and bark timber. In the spring and summer the women weed the corn; and enjoy a second harvest in September by hop-picking. Formerly, in the dead months they availed themselves greatly by spinning wool, for making of barragons, a genteel corded stuff, much in vogue at that time for summer wear; and chiefly manufactured at Alton, a neighbouring town, by some of the people called Quakers: but from circumstances this trade is at an end.* The inhabitants enjoy a good share of health and longevity; and the parish swarms with children.

* Since the passage above was written, I am happy in being able to say that the spinning employment is a little revived, to the no small comfort of the industrious housewife.

ROCKY HOLLOW LANE.

Fig. 14.
Rocky Hollow Lane, Gilbert White, *The Natural History of Selborne*, 1853.

and the pliability of his narrative. In the 1837 edition of the *Natural History* edited by Edward Turner Bennett (1797-1836), a vignette depicts one of the hollow lanes underneath a wooden bridge. Just visible are two tiny figures standing high above on the bridge framed by a dark wood; a torrent flows beneath (Fig. 13).[24] The scale of the human figures to the landscape shows their insignificance in the face of this foreboding natural wonder. In 1853, William Jardine (1800-1874) published a one volume edition of White's book for the National Illustrated Library series. Priced at 2s, 6d in cloth, this edition offers two illustrations featuring the hollow lanes. The first is a conventional image of a perambulator with a travel case or bag and a walking stick treading on the hollow lane below a bridge. The other illustration shows what appears to be a family of labourers stopped along the lane (Fig. 14); looming is the shadow of White's ominous 'tangled wood.'[25] The accompanying text from White explains that Selborne '[abounds] with poor; many of whom are sober and industrious.' The parish's labouring class are occupied in husbandry; men also work in the hop-gardens and in felling timber. Women weed in the corn-fields and pick hops. Formerly, White tells readers, they also spun wool for textiles made at Alton but this work has fallen off. The



vi OF SELBORNE 11

LETTER V.

TO THOMAS PENNANT, ESQ.

Among the singularities of this place the two rocky hollow lanes, the one to Alton, and the other to the forest, deserve

ROCKY LANE LEADING TO ALTON.

our attention. These roads, running through the malm lands, are, by the traffic of ages, and the fretting of water, worn down through the first stratum of our freestone, and partly through the second; so that they look more like water-courses than roads; and are bedded with naked rag for furlongs together. In many places they are reduced sixteen or eighteen feet beneath

Fig. 15.
Rocky Lane Leading to Alton, Gilbert White, *Natural History of Selborne*, 1875.

vignette, then, picks up White's theme of the labouring poor more explicitly than did previous illustrations of the scene. This portrayal of the humble rusticity of Selborne's inhabitants seems intended to evoke sentiment in readers. White's editor has added the following footnote at the end of this letter and above the illustration: 'since the passage above was written, I am happy in being able to say that the spinning employment is a little revived, to the no small comfort of the industrious housewife.'[26] The popularity of White's *Natural History* in the 1830s seems to have been connected to the extreme labour unrest in the countryside in 1830-31. The 'Captain Swing' uprisings — machine-breaking protests and hay-rick burnings by farmworkers — came in violent fashion to Selborne in November 1830. Among the protestors' demands was that the local vicar donate half his income to the parish's poor.[27] Despite White's mention of the 'sober and industrious' poor of Selborne, the *Natural History* is conspicuous for its elision of social history. The virtual absence of Selborne's poor from the *Natural History* made the work palatable to those Victorian readers seeking nostalgic and escapist accounts of England's countryside. Jardine's footnote about the revival of the spinning trade in Selborne in the 1850s and the accompanying illustration are attempts,

perhaps, to gently nudge White's *Natural History* towards a social history of the parish.

When Frank Buckland (1826-1880) published his elegant edition of the *Natural History* in 1875, illustrated by P. H. Delamotte (1821-1889), another vignette of the hollow lanes was included (Fig. 15).[28] The emphasis has shifted again, however, and, this time, the hollow lane to Alton is presented as a picturesque scene. A single female figure is walking on the lane and, while some branches still reach over the pathway, the vegetation on either side of the lane appears well-controlled. Patches of wildflowers seem artfully arranged — as though the work of a gardener. Far from a 'rugged gloomy scene' that 'affrights the ladies,' this vignette bespeaks a tamed nature suitable for a promenade. It was in 1847 that a new road from the village of Selborne to Alton had been built making travel by the hollow lane unnecessary.[29] The theme of the labouring poor evoked in the 1853 illustration is replaced by the tranquil atmosphere of Delamotte's vignette. Selborne is presented as a sanctuary, much like a landscape garden, from the smoke and confusion of modern Victorian life. It is a not too subtle irony that the kinds of technologies which brought inexpensive editions of White's *Natural History* to Victorian readers, such as steam-powered presses, made the need for escape and for ecologically-minded citizens even greater.

Over the course of the nineteenth century, as some of White's observations lost their currency, the material form of his book shifted accordingly. One publisher's strategy for making the volume attractive might, later, cause the science in the *Natural History* to appear out-of-date. A striking coloured plate of a 'hybrid bird,' which served as a frontispiece in the 1825 edition, was gradually dropped from subsequent editions because it aligned White's volume with the strange specimens in cabinets of curiosities instead of the insights of modern ornithology. Extensive (and tactful) annotation became necessary to address White's misunderstanding of the process by which a hen pheasant takes on male plumage.[30] White's account of Selborne's flora, sent to Barrington in two letters in 1778, caused later editions of the *Natural History* to swell. In some instances, the notes that Bennett appended to these two letters in his 1837 edition occupy the majority of the printed page. White's call for greater attention to be paid to the cultivation of grasses results in a lengthy note about the publication of *Hortus Gramineus Woburnensis*

(1816, 1825) by George Sinclair (1786-1834). This work, whose first edition was illustrated by actual specimens of grasses, detailed experiments with grasses at the Woburn Abbey estate of John Russell, the sixth Duke of Bedford (1766-1839). Bennett's notes to White's account of the crocus exemplify the delicate balance the editor tried to achieve between paying homage to White and bringing his work in line with current taxonomy: 'The more minute analysis that has been obtained since the time of Gilbert White has produced an immense change in the views of botanists with respect to this genus. *Crocus* now consists of not one species, but of thirty at the least; and no fewer than four kinds are included among the plants of Britain. Yet this more strict definition of the crocuses scarcely tends to diminish the wonder expressed above.'[31] As Harting's 1887 edition demonstrates, later editors were rather less genteel in their interventions. Harting advises readers that 'it would appear that Gilbert White paid comparatively but slight attention to the vegetable productions' of Selborne. His 'scanty observations on the subject [of Selborne's botany] have been supplemented by the late Dr. Bell Salter,' who spent three days in September 1844 'botanizing' in Selborne.[32] It would seem, then, that White's lifetime of observations of the flora at Selborne could be superseded by a three-day expedition.

While recent refinements in botanical and ornithological knowledge caused some of White's nineteenth-century editors headaches when they came to his observations on particular species, it was the advent of Darwinism that compelled still other editors to recast White's work as a remedy for science that was now deemed too secular. White's *Natural History*, in fact, had made an early impression on Charles Darwin (1809-1882): 'From reading White's Selbourne I took much pleasure in watching the habits of birds & even made notes on this subject. In my simplicity I remember wondering why every gentleman did not become an ornithologist.'[33] Even with the publication of Darwin's *On the Origin of Species* already fifteen years in the past, when the theologian and geologist Buckland published his edition of the *Natural History* in 1875, he felt necessary to frame White's 'practical natural history' as 'the means of attracting many of the present generation — both young and old — to the observation of the living works of the great Creator.' Buckland's 'handsome Edition' of White, he hoped, would 'help to counteract the growth of doubt, infidelity, and atheism, which...must become bitter weeds in the future, of

no assistance to science, and sure promoters of a dangerous materialism.'[34] Of all the nineteenth-century editions of the *Natural History*, Buckland's 1875 and 1876 (with an additional eight photographs of birds) are arguably the most beautiful. If White's parochial natural history was intended to train readers in a restrained, pious model of inquiry, Buckland's editions, perhaps more than any other, made sensuous objects of the natural phenomena documented by White. Delamotte's delicate vignettes of birds — of a whitethroat among foliage and of a redstart perched on a stump — are interspersed with haunting engravings of birds' eggs. The surfaces of some eggs resemble moonscapes. Full-page photographs 'by the carbon process' appear in Buckland's 1876 edition; images of the swift and the swallow are particularly dramatic.[35] Buckland's editions of White articulate one of the central paradoxes of Victorian natural history publications. The very works that eschewed materialism and argued for a disciplined approach to natural history exploited new advances in book design and techniques of illustration to please the hungry gaze of readers.

The same year that Buckland brought out his heavily illustrated edition of White's *Natural History*, a new edition by Harting also came onto the market. Harting's publishers had gained the copyright of what was considered the 'standard' edition of the *Natural History* (Bennett's 1837 edition). Thus, even with Buckland's edition in the offing, it was shrewd to prepare a new edition of White in 1875. The 'unexpected acquisition' of Thomas Bewick's engravings by the publishing firm Bickers and Son solidified plans for Harting's edition. Where Buckland had recourse to Delamotte's vignettes and photographs, Harting had at his disposal the illustrations of one of England's foremost innovators in wood engraving.[36] Bewick was about thirty years White's junior, and the introduction to volume one of his landmark publication, *History of British Birds* (1797-1804), pays tribute to the 'ingenious Mr. White' for his enumeration of birds of passage and his attentiveness to the 'language' of birds.[37] Like White's *Natural History*, Bewick's *British Birds* was long in gestating. Both books were to do much to train nineteenth-century readers in visual observation and to spur interest in regional faunas.[38] The presence of Bewick's engravings in White's *Natural History* is appropriate as both naturalists were invested in the model of practical ornithology and how birds fit within the 'economy of nature.' Despite both figures being known for

their observations of birds 'on the wing,' both also worked from specimens brought to them by local gamekeepers, gentry, and neighbourhood boys. Where White takes readers with him to the moors and marshes to observe species, Bewick's engravings puts these birds directly at eye-level.

What both Harting and Buckland underscore in the prefaces to their respective editions of White's *Natural History* is that much has changed in the environment and in the distribution of species since White's (and even Bewick's) day. Buckland is unequivocal about how best to study local fauna: 'All I beg on behalf of the wild birds is not to shoot them; leave the gun at home, and take the opera glasses and watch their habits.' He urges 'Country proprietors' (owners of parks and woodlands) to practice a stewardship of their winged 'tenants.' Landowners 'would do well to stop the destructive hand of the gamekeepers, who are gradually exterminating all our indigenous fauna, for want of knowledge of the ways in which the forces of nature are balanced.' Clergyman have their own role to play in the preservation of fauna, Buckland asserts. They should emulate White's model and tend to the 'many parishioners inhabiting the woodlands, hedges, and fields, whose welfare they would do well not to neglect.'[39] Harting registers a more particular series of changes at Selborne since White's time. Part of Wolmer Forest is now enclosed and Bin's Pond has been drained to enable cattle-grazing. The red deer of Wolmer Forest 'have long since become extinct,' and 'those noble birds the Bustards, which once frequented the downs...have entirely vanished as denizens of England.'[40] Buckland's use of the term 'balance' and Harting's reference to the extinction of various species point to the ecological themes already present in White and which, in the context of the nineteenth century, became increasingly urgent.

Charles Fothergill's Interleaved Copy of Bewick's *British Birds*

Just what, precisely, were the practices of the nineteenth-century amateur ornithologist? In what terms did these ornithologists conceive of the decline of various species? The Fisher Library holds an interleaved copy of the 1804 edition of Bewick's *British Birds* that throws new light on the questions above. Owned and extensively annotated by the Yorkshire naturalist and Canadian politician Charles Fothergill, the prove-

nance of this copy of Bewick makes it particularly significant. Like Parr Traill, Fothergill made the journey from England to Canada in the first decades of the nineteenth century — he in 1816 and she in 1832. Also like Parr Traill, he settled for a time in the Rice Lake region and set about cataloguing the fauna he observed in his adopted country.[41] One item that travelled with Fothergill, from Yorkshire to Canada, was his battered interleaved copy of Bewick's *British Birds*. Fothergill's Bewick seems to be an example of bespoke interleaving. As Jackson explains in *Marginalia*, until about the mid nineteenth century and before machine binding was the rule, book owners with sufficient means could arrange to have a blank leaf bound in between each printed leaf of a book.[42] This extra space allowed readers to record their own observations. Fothergill came from a notable Quaker family and was related to the eminent naturalist John Fothergill (1712-1780). Charles's uncle, William Fothergill (1748-1837), with whom he maintained a lively correspondence about birds, was an amateur ornithologist.[43] Charles Fothergill published his first ornithological work at the age of seventeen. This eleven-page pamphlet, entitled *Ornithologia Britannica*, classified 301 species of British birds. Well-versed in White's *Natural History* and personally acquainted with Bewick, it appears likely that Fothergill planned to use his two-volume copy of *British Birds* as a repository for his own ornithological observations and thus asked a binder to assemble an interleaved copy.

The recent collection of essays, *Interacting with Print: Elements of Reading in the Era of Print Saturation* (2018), traces the diverse ways in which readers 'marked' their books in the eighteenth and nineteenth centuries. This study argues that marking is always a 'materially determined phenomenon' and one which illuminates the everyday use of books, as well as how manuscipt practices might 'disrupt' or even 'complete' the printed page.[44] Fothergill's interleaved copy of Bewick's *British Birds* is a case in point for how nineteenth-century readers came to books not as fixed expressions of knowledge but as texts that could be productively disrupted. A binder's insertion of blank leaves between the pages of Bewick's volumes was the first step in this disruption. Fothergill, in effect, intervened in Bewick's book by making notes on the blank leaves and by making material corrections to Bewick's engravings of species. We know that Fothergill practiced what Jackson calls 'strategic interleaving' to

advance his own ornithological projects.[45] The Fisher copy of Fothergill's ornithology pamphlet, published in 1799, is interleaved with his manuscript notes entitled, 'Birds that are Common to both England and the two Canadas — as discovered by C. F.'[46] These notes record his observations of species on the banks of the St. Lawrence, on Sugar Island, and at Rice Lake. Through interleaving, then, Fothergill's pamphlet became a pliable transatlantic document. In similar ways, Fothergill's interleaved copy of *British Birds* extends the geographical range of Bewick's book, as well as its life-cycle. Not all of Fothergill's notes on the blank leaves of his copy of Bewick bear dates, but his annotations span at least the period 1807-36. Fothergill established a printing office in Toronto in 1837 and thus it is not surprising that his interleaved notes waned during the last four years of his life.[47] While some of Fothergill's notes refer to his observations of birds in Yorkshire and elsewhere in Britain, others are rooted in the Canadian landscape.

Fothergill always intended to write his own epistolary natural history in Gilbert White's model. Like White, Fothergill had little regard for the 'librarian and closet naturalist.' As he puts it, 'my career has been in the field, on the mountains, in the forest, and on the floods — for more than thirty years.'[48] Where Charles Fothergill articulates a sharp distinction between the closet and field naturalist, at times, his uncle adopts a more measured stance. Preserved in the interleaved copy are snippets from Charles' correspondence with William, who transmitted much information about the birds in Wensleydale, North Yorkshire. In one such extract, dated 25 November 1807, William urges all practical ornithologists 'to look into nature, as well as books.'[49] Fothergill's copy of Bewick amply demonstrates how first-hand encounters with birds in their environments, printed knowledge, and manuscript practices might coalesce in ornithological inquiry. Drawing on the Renaissance tradition of commonplacing, Fothergill copies passages from his reading in ornithology onto the blank leaves in his Bewick. John Ray (1627-1705), Francis Willughby (1635-1672), John Latham (1740-1837), and George Graves (1754-1839) figure prominently in Fothergill's notes. Not afraid to challenge his printed sources, on the leaf facing Bewick's entry for the lanner, Fothergill lists almost every authority on British birds and asserts that all have failed in their efforts to classify this species.[50] Writing 'from actual observation,' Fothergill contradicts Pennant's assertion that the long-

eared owl is not found in the north of England: 'In one morning's walk...I have counted no less than 5 of these birds.'[51] Regarding the white owl, though White 'has given the best account of its manners,' Fothergill can add the following: 'On fine evenings, and in clear moonlight nights, this species is remarkably active...there is something very frightful and peculiarly terrific in the scream of this bird...it seems to be a language of defiance, or of allurement.'[52] Also recorded in the facing leaves of his Bewick are the results of Fothergill's own experiments, including one in which he substituted two canary eggs for two linnet eggs in a nest to determine whether they would hatch.[53]

For Fothergill as for many nineteenth-century ornithologists, shooting birds was considered a valuable means of studying particular species. Next to Bewick's entry for the ringtail, Fothergill explains that 'in some ringtails I have killed I have found the irides of a hazel-colour — so that yellow irides is not a standing or permanent characteristic.'[54] Fothergill adds to Bewick's account of the merlin by noting that 'I killed a female merlin, on her nest...she weighed 3 3/4 oz. but had a small bird in her stomach.'[55] On the banks of the Don river in Toronto, in April 1824, Fothergill shot a golden-crested wren. This outing, documented on the blank leaf facing Bewick's account of the species, allowed Fothergill to refine his knowledge about this particular wren.[56] Having killed lesser redpoles in America and Canada, Fothergill augments Bewick's account of the species by supplying details on the colouring of North American specimens.[57] Accidental deaths could also yield information. In 1823, Fothergill's son brought him a 'fine specimen' of a short-eared owl that drowned in a creek that flowed through his property at York (Toronto).[58] Bewick, himself, was the recipient of countless dead specimens while he prepared the engravings for *British Birds*, as landowners, clergymen, soldiers, and ships' captains all proudly sent in their kills for his persual.[59] With Fothergill's own shootings of species documented next to Bewick's printed pages, which acknowledge the receipt of dead specimens from sportsmen, we learn just how much nineteenth-century ornithology depended on the killing of birds.

In addition to the birds that Fothergill shot, stuffed specimens encountered in museums and items procured through the bird trade fed Fothergill's descriptions of species. The interleaved pages bring into focus the world of nineteenth-century bird collections. In Fothergill's estima-

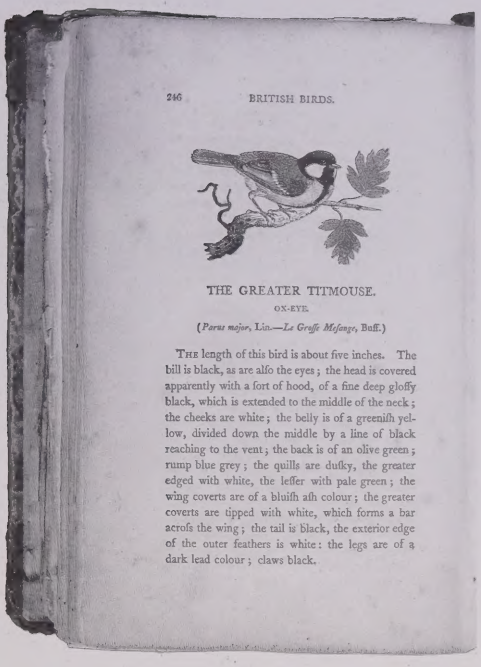
tion, the Leverian Museum's specimen of the wood chat is poor, while that held in the London museum of William Bullock (?1773-1849) is superior. One of the period's most significant collections of birds was assembled by Marmaduke Tunstall (1743-1790), and Bewick completed some preparatory drawings for *British Birds* from specimens in this museum.[60] When the collection moved to the Grange near Darlington, Fothergill examined there a 'fine specimen' of the Dartford warbler.[61] At Wycliffe in 1808, Fothergill 'visited a singular character who lived in that romantic village close upon the margins of the Tees and found amongst his collection of stuffed birds a rook that was killed at the seat of Wm. Craddock...which was altogether of a cinerous colour.'[62] If sociability and a knowledge of public and private collections of birds were advantages to the ornithologist, so, too, was a grasp of the dynamics of the bird trade. Having purchased a female kestrel that came from 'New Holland,' and not wishing 'to keep any foreign birds in my collection,' he exchanged it and several of his specimens with 'Thompson the Dealer' in order to procure 'some rare British Birds' which he lacked.'[63] Local bird-catchers were sources of information for Fothergill as were bird 'fanciers.' At Bath, Fothergill met a fancier who bred crossbills and encountered him again in Bristol with a cage of such birds. Noting grimly that the fancier was doing a brisk business with individuals who are 'otherwise indifferent to birds' and who are buying crossbills as 'curiosities' for their 'singular' bills and striking plumage, Fothergill, himself, purchases a male and female crossbill from the fancier 'to study their manners.' Unfortunately, one of these older birds died in transit having been put on a 'common stage waggon.'[64]

For each of Bewick's printed pages, then, Fothergill supplies a response based on additional textual authorities and his own observations. The interleaved pages function as a kind of journal or diary in which Fothergill logs his experiments, shooting expeditions, and experiences with collectors and bird-dealers. Inasmuch as the interleaved copy of Bewick can be viewed as preparatory to Fothergill's planned ornithological publications, its observations were also intended to purge Bewick's *British Birds* of what he considered to be its errors. Fothergill's manuscript notes for a projected natural history include a copy of a letter that he intended or possibly did send to Bewick from his cottage in Ontario after the latter published a supplement to *British Birds* in 1821. Here he rebukes Bewick for not improving on his earlier descriptions of the peregrine falcon and on the

lanner. Moreover, Fothergill claims that Bewick has not acknowledged properly his use of Fothergill's drawings and notes. Still, in a mark of his committment to advancing the field of ornithology, Fothergill remains willing to send Bewick further accounts of species.[65] In fact, Bewick does credit Fothergill in his revised description of the little horned owl in the supplement: 'the stuffed specimen of this rare and curious little bird, from which our figure and description were taken, was sent to the author by Mr. Charles Fothergill, late of York.'[66]

If the notes compiled in his interleaved copy of Bewick were meant to improve the textual accounts of species in *British Birds*, Fothergill also used this copy to render judgement on Bewick's visual accounts of species and on those who attempted to imitate his engravings. Bewick exploited the vignette format to depict birds in profile perched on a branch, and birds in their habitats. Bewick's use of the 'lowering' technique (or cutting away) of portions of the surface of the wood block resulted in delicate shades of grey. As Jenny Uglow explains, these tonal gradations could 'suggest texture — the softness of down, the sharpness of claw — as well as shadings and shape.'[67] The imaginativeness of Bewick's engravings led the authors of some subsequent illustrated works of ornithology to 'borrow' his figures. In his interleaved notes, Fothergill is highly critical of the illustrations by George Graves, whose *British Ornithology* had appeared in 1811. Fothergill accuses Graves of pilfering Bewick's work. On the blank leaf facing Bewick's account of the kestrel, Fothergill writes the following: 'Graves has copied this figure even to the bough of the tree upon which it is sitting which is really unpardonable. Tho. like most copiests he has by no means equalled the original which is the best representation of this beautiful species that I have seen.'[68] Despite having to work from dead specimens in many cases, Bewick aimed, as Diana Donald has argued, to depict the 'living appearance' of birds.[69] Fothergill seized on this quality of Bewick's engravings and the latter's rendering of the greater titmouse meets with Fothergill's approval (Fig. 16). As he notes of the engraving, 'this is an excellent figure...it seems in motion and gives a good idea of its manner of sitting ever ready & springs forward.'[70]

Bewick did not always earn Fothergill's unqualified praise, however, and in those instances where he deemed one of Bewick's engravings to be flawed, he simply corrected it on the printed page. Such interventions tell us much about the ways in which nineteenth-century readers



246 BRITISH BIRDS.

THE GREATER TITMOUSE.

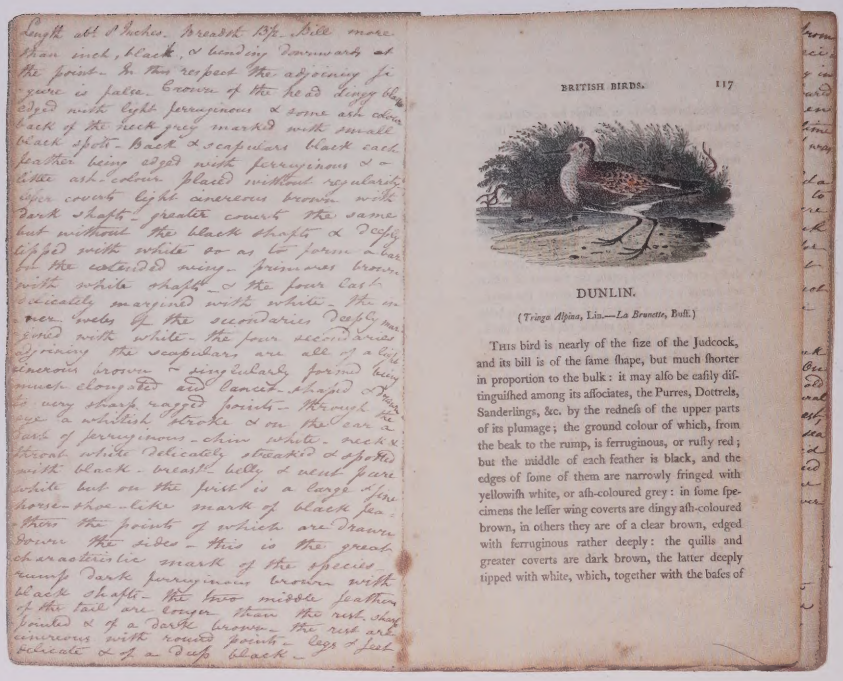
OX-EYE.

(*Parus major*, Lin.—*La Grosse Mesange*, Buff.)

The length of this bird is about five inches. The bill is black, as are alſo the eyes; the head is covered apparently with a ſort of hood, of a fine deep gloſſy black, which is extended to the middle of the neck; the cheeks are white; the belly is of a greeniſh yellow, divided down the middle by a line of black reaching to the vent; the back is of an olive green; rump blue grey; the quills are duſky, the greater edged with white, the leſſer with pale green; the wing coverts are of a bluiſh aſh colour; the greater coverts are tipped with white, which forms a bar acroſs the wing; the tail is black, the exterior edge of the outer feathers is white: the legs are of a dark lead colour; claws black.

Fig. 16.
Wood engraving, greater titmouse, Thomas Bewick, *British Birds*, 1804.

inserted themselves into printed books. Fothergill was an accomplished natural history artist and clearly did not view Bewick's engravings as fixed, inviolable representations. Fothergill's own fresh kills of a species compelled him to colour some of Bewick's black and white engravings.[71] This tinting of Bewick's engravings serves as Fothergill's attempt to 'complete' them. The leaves facing Bewick's account of the dunlin (a shorebird) reveal that at Scapa Bay in the Orkneys, Fothergill shot one of these birds. This 'remarkably fine & beautiful specimen' enabled him to provide, in his written description, a level of detail about the colours of the dunlin's feathers and its anatomy that far exceeds that of Bewick. Not content with Bewick's monochrome vignette, Fothergill 'coloured the plate from the same specimen' that he acquired at the Orkneys.[72] Indeed, Bewick's engraving is now tinted with ash, brown, rust, and grey to distinguish the patterns of the dunlin's plumage (Fig. 17). Bewick's engraving of the guillemot also receives refinement by Fothergill's brush: 'Bewick's figure is tolerably well drawn — I think I have improved it — see the uncoloured copy.'[73] Of Bewick's engraving for the common tern, Fothergill writes: 'This figure is by no means well done — I have, however, endeavoured to improve it as much as possible.'[74] After Fothergill's intervention, the feathers of Bewick's tern appear a subtle mixture of blue and lead.



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DUNLIN.

(*Tringa Alpina*, Lin.—*La Brunette*, Buff.)

This bird is nearly of the fize of the Judcock, and its bill is of the fame fhape, but much fhorter in proportion to the bulk: it may alfo be eafily diftinguifhed among its affociates, the Purres, Dottrels, Sanderlings, &c. by the redneſs of the upper parts of its plumage; the ground colour of which, from the beak to the rump, is ferruginous, or ruſty red; but the middle of each feather is black, and the edges of fome of them are narrowly fringed with yellowiſh white, or aſh-coloured grey: in fome ſpecimens the leſſer wing coverts are dingy aſh-coloured brown, in others they are of a clear brown, edged with ferruginous rather deeply: the quills and greater coverts are dark brown, the latter deeply tipped with white, which, together with the baſes of

Fig. 17.
Hand-coloured plate in Charles Fothergill's copy of Thomas Bewick, *British Birds*, 1804.

Of all the vignettes which Fothergill revises, it is Bewick's engraving of the smew that most inspires Fothergill the artist-naturalist (Fig. 18). It was not only shooting expeditions that shaped his accounts of species. In the case of the smew, Fothergill's notes in his copy of Bewick record a purchase on 5 February 1805 of a male smew for three shillings and a six pence at a poulterer's in London's Red Lion Square. Not for the squeamish is the portrait that Fothergill gives us of the nineteenth-century ornithologist-at-work. After bringing the smew home from the poulterer's, he measured and weighed the bird, dissected it, and then cooked and ate it. He was glad to find that it tasted 'by no means fishy.' His encounter with the smew caused him not only to colour Bewick's engraving but also to offer his own painting of the species on the blank leaf. Fothergill intends his illustration to capture the bird's thick serrated bill, large eyes, and dark irides.[75] Not strictly an example of extra-illustration but, rather, an extension of the marginalia made possible by an interleaved copy, Fothergill's watercolour nonetheless represents his addition of illustrations not supplied by the publisher.[76] Fothergill also supplies his own watercolour of the shag for Bewick's account of this species, and pencilled silhouettes by Fothergill of birds appear elswhere in the second

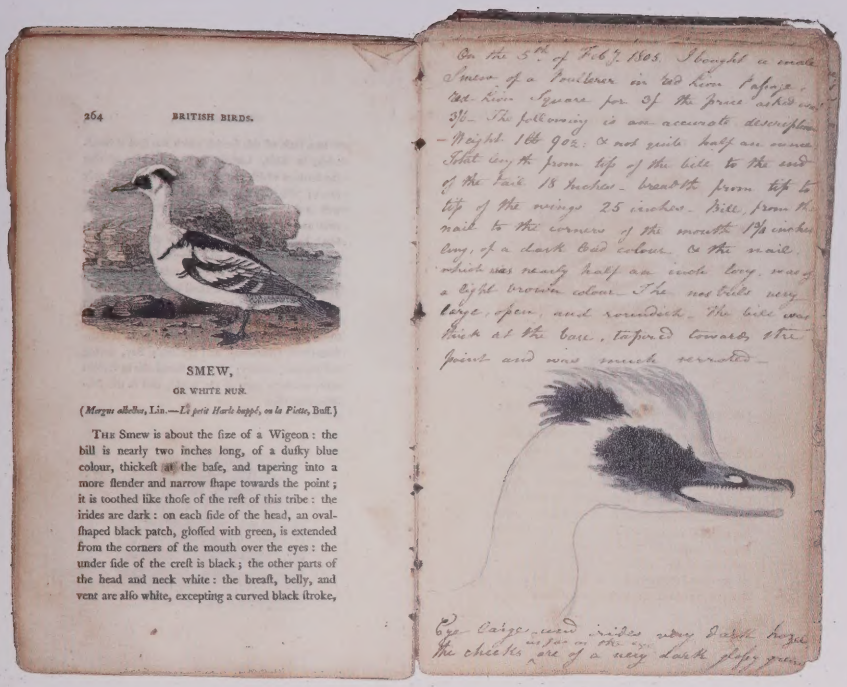
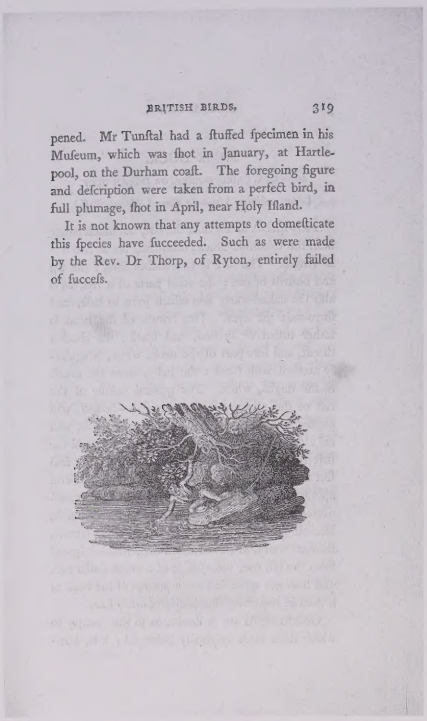

264 BRITISH BIRDS.
SMEW,
OR WHITE NUN.
(Mergus albellus, Lin.—Le petit Harle huppé, ou la Piette, Buff.)
The Smew is about the size of a Wigeon: the bill is nearly two inches long, of a dusky blue colour, thickest at the base, and tapering into a more slender and narrow shape towards the point; it is toothed like those of the rest of this tribe: the irides are dark: on each side of the head, an oval-shaped black patch, glossed with green, is extended from the corners of the mouth over the eyes: the under side of the crest is black; the other parts of the head and neck white: the breast, belly, and vent are also white, excepting a curved black stroke,

Fig. 18.
Hand-coloured plate and drawing in Charles Fothergill's copy of Thomas Bewick, *British Birds*, 1804.

volume of Bewick's work.[77] Supplementing the printed text with his own manuscript notes, setting down his own figures of birds, and hand-colouring Bewick's plates, Fothergill's disruption of Bewick's volumes was substantial. In certain circumstances, then, an interleaved copy of a book might turn a reader into a book's author and illustrator.

For all that Fothergill's interleaved copy of Bewick illuminates about how one particular nineteenth-century amateur ornithologist interacted with print, this copy preserves still more critical information among its leaves: it documents the decline and extinction of various species during Fothergill's lifetime. Bewick's own stance regarding the shooting of birds is not transparent.[78] In the advertisement to the second volume of *British Birds* (1804), that dedicated to water birds, Bewick apologies for the long delay (seven years) in publishing his second volume and for any 'deficiencies' in the engravings: these problems are 'to be attributed to the difficulties the sportsman meets with in coming at many of the shy inhabitants of the ocean, and of the pathless misty marsh.'[79] Ostensibly paying tribute to the sportsmen who have provided specimens for his account of water birds, Bewick's lines above also subtly point to the infiltration, by sportsmen, of these 'shy' birds' habitats. A number of the tailpieces in the


BRITISH BIRDS. 319

pened. Mr Tunſtal had a ſtuffed ſpecimen in his Muſeum, which was ſhot in January, at Hartlepool, on the Durham coaſt. The foregoing figure and deſcription were taken from a perfect bird, in full plumage, ſhot in April, near Holy Iſland.

It is not known that any attempts to domeſticate this ſpecies have ſucceeded. Such as were made by the Rev. Dr Thorp, of Ryton, entirely failed of ſucceſs.

Fig. 19.
Wood engraving of duck hunter, Thomas Bewick, *British Birds*, 1804.

water birds volume pick up on this theme of the threat posed by human beings to birds.[80] In one tailpiece, a sportsman aims a rifle at the red godwit, while in another, he is poised to shoot a common tern. A different tailpiece features a sportsman reclining with his hunting dog after having killed a lesser tern and another depicts a man armed with a rifle hunting the mallard. A male figure in one tailpiece strains to hold onto a branch, with his rifle nearby, as he reaches into the water to pull up the eider duck he has just shot (Fig. 19). In the same vein is a tailpiece showing a man lurking in the bushes with a pitchfork as two pochards sit on the water's surface unawares. If armed with less deadly weapons, women are equally menacing in Bewick's tailpieces — threatening geese in their yards. First published in 1804, these unsettling scenes of human beings persecuting wild birds gained resonance as the nineteenth-century wore on. It was in 1807, David Allen writes, that one of the most significant innovations in firearms occurred by a duck-hunting clergyman — the invention of the detonating or percussion principle. By the mid 1820s, the copper percussion cap, effective in rainy conditions, was in wide-spread use by the sportsman.[81] In a notebook, a young Fothergill recorded what his father John gave him for the birds and game that he shot as a sportsman. For

each blackbird, in 1796, he received one penny.[82] Fothergill's career as a sportsman coincided with the invention of deadlier weapons for shooting. He also witnessed the increasingly frequent drainage of marshes and fens for agriculture by Yorkshire landowners. Recalling Buckland's plea, in the preface to his 1875 edition of White's *Natural History of Selborne*, for naturalists to 'leave the gun at home' and Harting's references, in his own 1875 preface to White, to the extinction of the bustard, let us now turn to Fothergill's observations on the decline, in his own time, of various species of land and water birds.

Because Fothergill's notes in his interleaved copy of Bewick's span the first three decades of the nineteenth century, they offer a wider perspective on the decline and extinction of various species than does Bewick's *British Birds* alone. Where Bewick writes the following of the common crane, 'they formerly visited the fens and marshes of this island in large flocks, but they have now entirely forsaken it,' Fothergill, in the leaf facing Bewick's account, offers an even more pointed statement about the cause of the crane's disappearance. In a passage that appears opposite another of Bewick's troubling tailpieces showing a man clinging to a tree branch suspended over water, presumably to take up a water bird, Fothergill asserts, 'the present scarcity of these birds has certainly been occasioned by the drainage of all, or many of our principal fens and marshes.'[83] Fothergill also registers, in his interleaved notes, the scarcity now in England of the stork and the great white heron.[84] Of the bittern, he warns ominously and correctly, 'the bittern is becoming extremely scarce in this country and its total extinction may be fairly prophesied. In many places where it was formerly common, not one is now to be found.' As the reason for this species' decline, Fothergill refers to his accounts of the crane and stork, where he identified the drainage of marshes and fens as the primary factor.[85] The avocet occasions a longer meditation by Fothergill on the conditions of its decline: 'before Sunk-island, near the mouth of the Humber, in Yorkshire, was drained and so generally cultivated, the Avosette bred in its marshes every summer, in considerable numbers — but whether this is the case now, or not, I am not able to state — since that island presents a great & singular instance of agricultural improvement.' Fothergill notes that 'this rare bird is still occasionally to be found upon the shores of the Humber river.[86] Enclosure and the drainage of wetlands figure prominently in Fothergill's passages on the

decline and extinction of species of land birds as well. Of the 'noble species' of the wood grouse (capercaillie), 'once the monarch of our woods,' he writes, '[it] is certainly extinct in England.' Fothergill prevaricates when he remarks, 'however the ornithologist or sportsman may regret the loss of this species we ought generally to rejoice that those large tracts of formerly unproductive land necessary to the independence & even the existence of this bird now smile in plenty & contribute the support of thousands of human beings.'[87] In these lines, economic imperatives would seem to trump even the curiosity of the naturalist and the pleasure of the shooter. Fothergill's account of the Great Bustard — 'by far the noblest of British land birds' — portrays its extinction as inevitable and justified: 'it appears to be certain that, as our extensive districts of waste land become reclaimed this species must decline & become extinct — since it cannot exist in a well cultivated or inclosed country.' In virtually the same language that he used to describe the extinction of the wood grouse, Fothergill states, 'but however this event may be regretted by the zealous ornithologist, who will be sorry to lose so noble a family of birds, he cannot but rejoice that the exinction is caused by so long a wished for national advantage as the general inclosure of our waste lands.'[88] Writing in 1797, Bewick observed that 'bustards were formerly more frequent in this island than at present,' and that are still to be found in some areas of Yorkshire.[89] Fothergill, just a few years later, makes this species' disappearance from the north of England a certainty.

In addition to positing what he considers to be the cause of the decline and extinction of species, Fothergill's notes in his copy of Bewick also document the distribution of species at specific points in time. His initial notes on the already rare species of the Greak Auk discuss its breeding habits in the Orkneys. In a second set of notes, he mentions that it has, in fact, been several years since the Great Auk has bred in Fair-Isle. A third set of remarks by Fothergill are still more grim: 'Although the chief object of my visit to Fair-Isle was to obtain this bird and its egg, I was not so fortunate even as to see one. It is one of the birds that will probably soon be extinct on the British Shores.'[90] Because we know that Fothergill was in the Shetlands and Orkneys in 1806, his observations on the decline of the Great Auk are especially significant for charting its demise.

While, at times, Fothergill is quick to sacrifice the curiosity of the ornithologist to the drive for economic progress, his interleaved copy of

Bewick links the consumption of birds as delicacies and as items of fashion with their mistreatment and decline. According to Fothergill, 'in the whole catalogue of British Birds there is not one more curious than the ruff' for its manners and plumage. He dwells on how these birds are an 'article of very considerable traffic in the fens of Lincolnshire where they are taken in nets & are confined in small pens, something like hen-coops, until they arrive at almost an incredible degree of fatness when they are sent to market.'[91] Fothergill writes these lines in the first decade or so of the nineteenth century. It would not be until 1824 that the Royal Society for the Prevention of Cruelty to Animals (RSPCA) would be founded. An Association for the Protection of Sea Birds was only formed in Yorkshire in 1868 with the Sea Birds Protection Act not passed until 1869.[92] Although Fothergill was an unapologetic sportsman, some of the very sentiments that would drive animal protection initiatives later in the century can be discerned, here, in his copy of Bewick's *British Birds*. In the instance of the ruff, Fothergill focuses on the species' confinement and then sale 'for the tables of epicures.'[93] Fothergill is more neutral in his description of how the skins of cormorants and shags are made into pelisses for ladies. While on the Isle of Man in 1815 or so, 'a foreign lady of distinction had one thus manufactured, from birds killed on the Island.'[94] Several decades would pass before, in 1885, a Plumage League was founded that required members to abstain from wearing feathers. The year 1885 also saw the founding of the Selborne Society for the Protection of Birds, Plants, and Pleasant Places; this group also discouraged the wearing of fashionable objects made from feathers.[95]

In 1894, the ornithologist William Henry Hudson (1841-1922) published an illustrated pamphlet for the Society for the Protection of Birds entitled *Lost British Birds*. The pamphlet describes thirteen 'lost' species who 'were summer residents and breeders, or inhabitants all the year round, of some part of Great Britain, but which no longer breed in this country and visit our shores only as rare stragglers, or, bi-annually, in their migrations to and from their breeding areas on the continent of Europe.'[96] Assisting Hudson in compiling this list was Harting, and the ornithologist and zoologist Alfred Newton (1829-1907). In order to disabuse readers of the notion that Britain has a plenitude of bird species, and that a list of thirteen lost species is inconsequential, Hudson begins his pamphlet by asserting that this number 'may not seem large to those

who are not ornithologists, and who have on their shelves a costly work on "British Birds," in, say, six or eight splendidly illustrated volumes.' Given that Lord Lilford (1833-1896) published the volumes of his luxurious *Coloured Figures of the Birds of the British Islands* between 1885-1897, and that Hudson mentions Lilford's work by name elsewhere in his pamphlet, it seems likely that Hudson has in mind these volumes. Hudson's reader will have to 'sacrifice' his or her copy of this illustrated ornithology in order to grasp the urgency of the lost thirteen species. Of the four hundred species depicted in Lilford, about 150 are merely 'visitors' and 'stragglers' to Britain; Hudson tells his reader to tear out all the plates from Lilford which are not true British birds. Of the 250 species that remain, he states that about fifty are already or will become extinct shortly. Since for practical purposes these are already lost, Hudson bids his reader to remove those plates as well: 'this done, a couple of hundreds of species will remain in the work, which, in its sadly mutilated condition, will better deserve its title; and the conviction will by this time have forced itself on its owner, that we have a very magnificent bird population on paper, but a very poor one in reality.' In another 'object lesson,' Hudson asks his reader to compare the plates of the threatened British birds to those who are in no danger of extirpation to see 'that invariably the finest species are the first doomed.' Among Hudson's points, here, is that multivolume illustrated works of ornithology obscure the actual sparseness of British species and their fragile state. He refers to the illustrations in his own pamphlet as 'greatly reduced black and white drawings' in comparsion to Lilford's plates.[97] Published by the Society for the Protection of Birds, Hudson's pamphlet would never have been a lavishly illustrated production. Even so, it was the consumption of birds as mere aesthetic objects that he was targeting and his spare illustrations are in keeping with this aim.

Hudson seems to be addressing readers with Fothergill's mindset when he writes, in his introduction, that the extinction and decline of species have often been attributed to 'the draining of the marshes, an improved system of cultivation, and kindred causes.' While allowing that these developments play a role in the destruction of the nesting-places of aquatic birds, Hudson thinks these shifts in land-use do not adequately explain the decline of species: 'when we look into the facts relating to the disappearance of the species noticed in this paper, we find that most of

them were lost to the direct action of man.' Contrary to Fothergill, Hudson holds the following responsible for the disppearance of species: 'Fowlers, gamekeepers, collectors, cockney sportsmen, and louts with guns.' These groups 'pursued [now extinct species] to the death, even as they are now pursuing all our rarer species.'[98] The overlap between Hudson's list of lost species — the common crane, the spoonbill, the capercaillie, the avocet, the great bustard, the black-tailed godwit, the Great Auk, the night reeler, the black tern, the bittern, the marsh harrier, the ruff, the hen harrier — and those species that Fothergill recognized as declining or having become extinct by the first decade and a half of the nineteenth century is striking. What Fothergill missed, or was blind to, was the role his own shooting and collecting activities played in the loss of such species. Writing near the beginning of the nineteenth century, Fothergill links the decline of the avocet to the draining of the marshes. In Hudson's account, however, the avocet had long been threatened. Even prior to widespread draining of the fens, avocets were relentlessly pursued by bird and egg collectors, and by the 'gunners.' Put simply, he writes, 'those who take pleasure in the possession of such remains as birds' feathers, bones, and egg-shells, are always glad to secure an avocet.'[99] In the case of the now rare bittern, Hudson explains, 'its strange richly coloured and beautifully pencilled plumage' causes even a 'straggler' who comes to British shores to be shot immediately and stuffed — 'something pretty in a glass case.'[100] Hudson finds it a challenge to decide which of the 'three inveterate bird-destroyers' is most a fault — 'the Cockney sportsman, who kills for killing's sake,' the gamekeeper 'who has set down the five-and-twenty most interesting indigenous species as "vermin" to be extirpated,' or 'the greedy collector, whose methods are as discreditable as his action is injurious.'[101]

It was Newton's campaign in the 1860s that urged British citizens to recognize the consequences of human-caused extinction and the 'exterminating process' of birds — the 'making them grow rare.'[102] Doubtless, Fothergill, in the first decades of the nineteenth century, would not have categorized himself as any of Hudson's three bird-destroyers, nor would he have assigned himself a role in what Newton labelled artificial extinctions. Nevertheless, the economies of exchange in which Fothergill participated to gain specimens for his ornithological inquiries, as well as his shooting of birds implicate him in the dynamics which caused the

decline of species. Whatever part he may have played in the disappearance of species and however much he may have misunderstood or ignored the true factors in such extinctions, his interleaved copy of Bewick's *British Birds* preserves for us now critical baseline information about the distribution of species in early nineteenth-century Britain. While Fothergill's strategic interleaving was intended to advance the state of ornithological knowledge in his own day, these notes now may well have fresh applications as the International Union for the Conservation of Nature's 'Red List' for Birds estimates that about thirteen percent of all bird species are threatened.[103] How and when certain species began to decline continues to absorb our attention, as well as why such losses in our own environment continue to mount. The observations of one Yorkshire ornithologist, set down in his copy of Bewick over two hundred years ago, might hold some answers.

Chapter Three: Containing Nature

Inasmuch as Victorian editions of Gilbert White's *Natural History of Selborne* fostered curiosity in readers about their local flora and fauna, even in its less expensive formats, White's work did not reach the lowest end of the market. In 1860, Routledge's edition of White without plates, bound in cloth, cost a sixpence; the same edition in boards sold for a threepence. That year, William Jardine's 'cheap edition' of White, also published by Routledge, sold for two shillings.[1] Not until publishers began issuing their 'shilling' natural history handbooks did country and seaside 'rambles' become a favourite pastime of Victorians. Aileen Fyfe has identified the availability of cheap excursion railway tickets and the instituting, in the 1850s, of half-holidays on Saturdays for middle and lower middle-class workers as crucial factors in the rising popularity of natural history pursuits.[2] Since 1848, the firm of George Routledge (1812-1888) had been issuing inexpensive titles in fiction for its *Railway Library*, but its series of shilling handbooks, *Books for the Country*, which began publication in 1852, exploited a ready market for natural history works. After Frederick Warne (1825-1901) left his partnership with Routledge in 1865, he began publishing his own shilling series entitled *Household Books — Country and Sea-Side Library*.[3] Shilling handbooks dovetailed with 'shilling days' at the Great Exhibition in 1851, when the price of admission was lowered for the working classes.[4] The popular 'shilling lectures' on such scientific subjects as entomology during the nineteenth century also made similarly priced natural history handbooks an obvious venture for publishers. While more grand collections of rare butterflies and shells continued to be assembled by learned naturalists, and while estate-owners were having plans drawn up for ferneries and elaborate rockwork gardens, with their small format and affordable price, shilling handbooks told Victorians lower down on the social scale what to look for during their country and seaside excursions, and how to examine and to preserve the specimens that they brought home.

Natural History for a Shilling

Routledge's shilling natural history handbooks hit their mark. In just one week in 1858, the first edition of John George Wood's *Common Objects of*

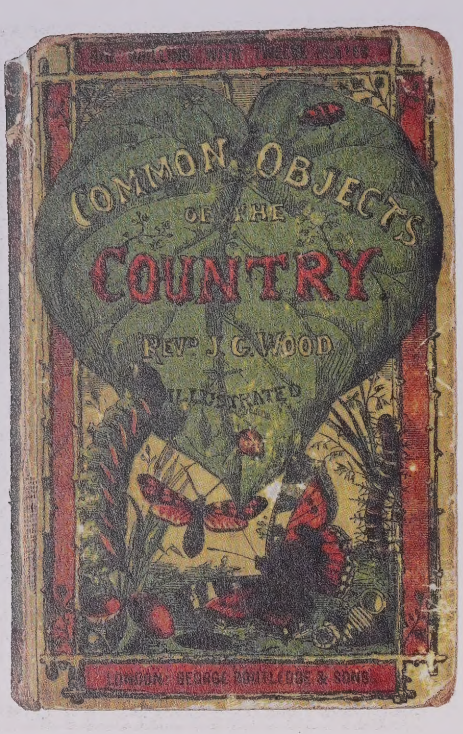


Fig. 20.
Cover, shilling handbook, John George Wood, *Common Objects of the Country*, 1866, Ruari McLean Collection. With kind permission of Robertson Davies Library, Massey College in the University of Toronto.

the Country sold 100,000 copies (Fig. 20).[5] As Wood's edition of the *Natural History of Selborne* sat just a little higher up the price scale on Routledge's list, he authored several shilling handbooks for this firm. In addition to his popular *Common Objects of the Country*, Wood penned *Common Objects of the Sea Shore* and *Common British Moths*. Routledge's shilling handbooks in boards came with 'plain plates.' Their more expensive versions, which sold for 'three and six,' offered coloured plates. Although a few of Routledge's one-shilling natural history books were paperbacks, most were 'yellowbacks,' so called because of the glazed yellow paper that covered their straw boards. Young naturalists are the intended audience of some of these pocket volumes; other titles are aimed at a broader readership of 'amateurs.' Necessarily, shilling handbooks concentrate on such practicalities as what equipment is essential for the rambler and where such items can be had at the most reasonable rates. Though many of these titles espoused natural theology, publishers trimmed the number of poetic extracts and extraneous material in favour of specific instructions about which plants and insects were the most curious and where these could be found. One of the shilling handbooks that William Coleman (1829-1904) authored for Routledge, entitled *Our*

Woodlands, Heaths, and Hedges (1859), is typical of this formula whereby the naturalist gains a 'prize' by taking notice of humble trees and shrubs. The linden (lime-tree) will yield the naturalist the caterpillars of the delicately tinted Lime-Hawk moth and the hawthorn in hedge-rows, the caterpillars of the Black-veined White butterfly. To keep sales brisk, the pocket volumes had to convince readers that the unremarkable parts of the English landscape were an infinite source of desirable specimens. Desolate 'moorland scenes' attract professional and amateur naturalists alike: 'Hither comes the botanist to seek some coveted rarity, perhaps rare to him only in his lowland home; or the enthusiastic "fern-collector," who has journeyed some two or three hundred miles to gather with his own hands a true "British specimen" of *Amesium Germanicum*, a *Cystopteris*, or a *Woodsia*, it may be, that he hears Mr. A has found on the sides of Ben-So-and-So; and he must go and find it too.' One detects in these lines Coleman's bemusement or cynicism at the acquisitiveness of the naturalist, even as he seeks, himself, to encourage such appetites for 'choice floral treasures.'[6]

Coleman's *Our Woodlands* was published as a companion to Wood's *Common Objects of the Country*, on whose success Routledge wished to capitalize. Part of the appeal of Wood's pocket volume lay in his decision to dispense with complicated taxonomies. As he puts it, in his 'little work,' 'scientific language has been studiously avoided.' Wood's aim is simply that of ensuring that 'no one with observant eyes can walk in the fields for half an hour without finding very many of the objects described in the book.'[7] As befits a book about 'common' objects, only typical creatures have been described and illustrated, such as the stag beetle and the mole, the stickleback and the newt. Twelve black and white plates, each one showing a group of specimens, based on illustrations by Coleman, appear in the one-shilling edition. In slightly more expensive versions, the plates were printed in colour by Edmund Evans (1826-1905) — an important engraver and colour printer from the mid-Victorian period.[8] The coloured plates are pleasing assortments of moths, dragon-flies, caterpillars, mosses, and the like; these groupings would have enabled readers to recognize the objects in the field (Fig. 21). Wood's method is to focus on the 'prettiest' species and to establish the value of creatures, such as the bat, not normally considered attractive. We see that Wood is a kindred spirit of White's in the providential frame of *Common Objects* and in its

Fig. 21.
Colour plate by Edmund Evans in John George Wood, *Common Objects of the Country*, 1866.

anthropomorphizing of insects and animals. Like White, Wood urges a quiet, patient observation of natural phenomena: 'As we do not intend to treat of the dead and dried bodies of animals, but of their active life, we return to our bat flitting in the evening dusk, and, instead of shooting him, watch his proceedings.'[9] Perhaps what resonated with some Victorian readers, especially city-dwellers on a railway excursion to the country, are the scenes of quiet in *Common Objects*. These held out the potential to connect with animal life: 'If an observer just sits down at the foot of a tree, and does not move, the most timid creatures will come within a few yards as freely as if no human being were within a mile.'[10] The escape that White's *Natural History of Selborne* provided for Victorian readers can be

found in Wood's work as well. The latter's apology for the naturalist's perambulations echoes White, while adding an even more explicitly psychological dimension: 'Now the real use of taking a walk is, to get away from one's self, and to change the current of the thoughts for a while, by changing the locality of the individual.'[11] Wood invites readers to accompany him on his country walks and relies on familiar frames of reference to describe these locales and their creatures. Choosing the common short-tailed field-mouse as the 'prettiest species' of mice, Wood writes of when 'first [he] made a personal acquaintance with these creatures' on the green where various sports are played. With red-tinged fur, this mouse has a 'farmer-like aspect, and looks as if it ought to wear top-boots.'[12] In order for readers to gauge the weight of the harvest-mouse, Wood compares its mass to a half penny. Like Parr Traill and White, Wood is a local naturalist to whom neighbourhood individuals bring specimens. A mower, for example, gives Wood a nest of the harvest-mouse that was 'about the size of a cricket ball, and almost as spherical.'[13]

Common Objects offers a window onto Wood's own natural history practices. He kept several creatures as pets including bats, snakes, moles, and newts. His conviction that many creatures are most usefully observed while alive (even if in captivity) dovetails with his belief in the sentience of animals. In a section entitled, 'The Law of Kindness,' Wood steers readers away from wantonly killing the objects of their natural history pursuits. If animal cruelty proceeds from the assumption that such creatures have no souls, Wood marshals scripture to argue that animals are the 'sons of man' and partake in immortality. Not wishing to accept that people are 'deliberately cruel,' Wood observes, 'it does really seem a new idea to many people that the inferior animals have any feelings at all.'[14] In its early years, the Royal Society for the Prevention of Cruelty to Animals (RSPCA), founded in 1824 and with a royal charter in 1840, focused on cruelty to domesticated animals.[15] Writing a couple of decades later, Wood registers the need for such animal protection organizations to expand their mandate. He even anticipates, perhaps, the formation of the Royal Society for the Protection of Birds (RSPB) later in the century. In his section, 'Sport or Murder,' Wood censures the 'ruthless powder-burners' who shoot at swallows and bats; enthusiasts of fox-hunting and pheasant-shooting also earn Wood's opprobrium. For some, 'nothing is valuable unless it is to be killed,' and 'sport' is merely a guise for

this cruelty.[16] Given its popularity, one wonders if *Common Objects* might have fed such animal protection initiatives. Wood's work certainly contradicts the logic of Victorian taxidermy manuals. Thomas Brown (1785-1862), another of White's editors, published one such manual in 1833, where he argued that the naturalist, 'on all occasions, prefers a reference to the stuffed animal to that of a pictorial representation.' According to Brown, a cabinet of taxidermy specimens gives one 'the mighty field of nature at one view' and permits naturalists to classify species.[17] In the context of ornithology, Anne Larsen points out that it was not until the end of the century that 'a general shift in popular sentiment brought field glasses and telescopes into the hands of naturalists' and the shot bird specimen lost some of its appeal.[18]

Insofar as he advocated the study of animals in the wild, Wood also offers his readers hints for collecting creatures that will serve ornamental purposes or will make elegant additions to one's entomology cabinet. For the well-appointed parlour, if the common lizard is 'captured without injury...it can be kept in a fern-case, and has a very pretty effect there.'[19] Wood subjects a number of creatures to dissections even if, at times, he has some scruples about how to secure specimens for the plate of his microscope. 'Not scientific enough to care nothing for the infliction of pain,' Wood is sufficiently curious about the anatomy of newts to put ten specimens into his 'poison-bottle.' The result was more disastrous than he imagined; the corrosive substance was not strong enough to kill the newts instantly and they suffered for a quarter of an hour before they died.[20] He considers it cruel when ladies catch a wasp and 'immolate it, by snipping it in two with their scissors,' and recommends instead that an oiled feather be brushed across the insect's body to extinguish its life swiftly and painlessly.[21] But as a microscopist, Wood dissects the organs of fish and insects. In the pursuit of closer 'views,' he puts the eyes of a cray-fish under his magnifying glass.[22] Natural objects also made their way into Wood's natural history cabinet. How to preserve the delicate tints of the wings of lepidoptera was a challenge for collectors and Wood relates a technique for snuffing out the life of moths without '[killing] the colours also.'[23] He is disappointed, after dousing a cray-fish in wine spirits, that its shell absorbed the red colour: this 'quite spoiled the appearance of a dissected cray-fish that was wanted to look nice in a museum.'[24] The imperatives of the collector — the preservation of pretty and intact spec-

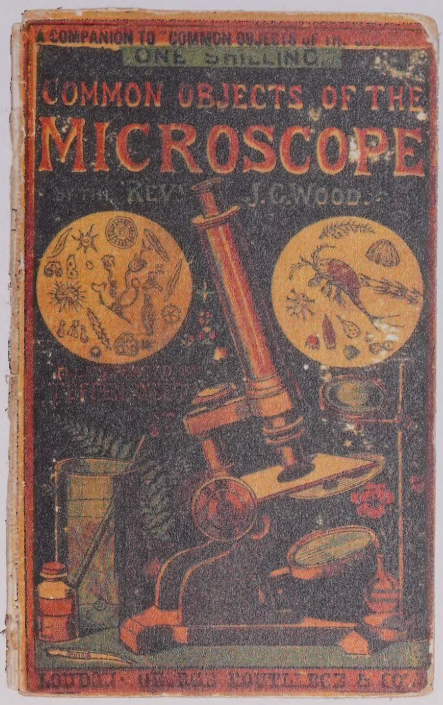


Fig. 22.
Cover, shilling handbook, John George Wood, *Common Objects of the Microscope*, 1861.

imens — trump any strict application of Wood's argument about the souls of all creatures. For Wood, a clergyman, natural history is a spiritual endeavour which mitigates a (male) individual's sense of alienation: 'a solitary man need never feel entirely alone as long as he can watch the life of a humble moth, and see in that despised creature some manifestations of the same feelings which actuate himself.'[25] There was a long tradition of finding in insects an allegory of the stages of human life and Wood rehearses this view in his account of the moth's metamorphosis.

Pretty Objects for Penny Microscopes

Once publishers had sent Victorian readers to the country to look for a certain moth perched on the trunk of the poplar tree or for a curious fungus growing on a hedge-shrub, another kind of pocket volume was required to explain what to do with one's specimens after the rambler had returned home. Accordingly, Routledge brought out a shilling handbook on microscopy by Wood: *Common Objects of the Microscope* (1861) (Fig. 22). His objective in this 'practical' work is 'to treat in a simple manner of those wonderful structures, whether animal, vegetable, or mineral, which are

found so plentifully in our fields, woods, streams, shores and gardens.'[26] Victorian microscopy handbooks often drew on collections of slides for sale by opticians. In Wood's case, he made use of slides from an optician at Holborn but also engaged the microscopist and illustrator Tuffen West (1823-1891) to collect most of the objects for the volume. West was responsible for the handbook's four hundred illustrations; these images were later printed in colour by Evans in the pricier version of the handbook. Because 'the microscope has become so firmly rooted among us, that little need be said in its praise,' Wood dispenses with a lengthy apology for the instrument. For those unable to ramble in the woods or by the sea-shore — for reasons of occupation, ill-health, or geography — Wood identifies a series of common objects that can be scrutinized by the microscope. With just a little light and some kind of microscope, most individuals can partake in the 'amusement and instruction' afforded by this valuable invention.[27] Price should be no barrier to the would-be microscopist. Wood assumes that most of his readers have met with 'those penny microscopes, composed of a pill-box and a drop of Canada balsam, which are hawked about the streets by the ingenious and deserving manufacturer.' If even these penny instruments are beyond one's reach, 'upon a pinch, a very respectable microscope may be extemporized out of a strip of card, wood, or metal, and a little water.'[28] For those readers who could afford ready-made instruments, dealers in microscopes sensibly advertised their wares in handbooks. Wood's volume contains the priced catalogue for microscopes sold by the firm from which he borrowed slides — Baker's on Holborn street.

Lynn Merrill has written of the ways in which the microscope 'made nature into an exhibit, a display for the eye to linger on.'[29] The appeal of Wood's handbook rests in his depiction of the everyday world as a source of such visually pleasing objects: 'even in London there is not a square, an old wall, a greenhouse, a florist's window, or even a greengrocer's shop, that will not afford an exhaustless supply of microscopic employment.' Often the most curious specimens are right in front of one's eyes: 'Even the humble vegetables that make their daily appearance on the dinner-table are highly interesting; and in a crumb of potato, a morsel of greens, or a fragment of carrot the enthusiastic observer will find occupation for many hours.'[30] In order to communicate the wonders of such objects, visible only through a microscope, Wood relies on resemblances. In his

account of a petal of a geranium, he first describes the visual appeal of seeing this ordinary household plant magnified: it '[exhibits] a most beautiful "stippling" of pink, white, and black.' Each single cell '[looks] very like the mountains on a map.'[31] The seed of a snapdragon inspires two different comparisons by Wood: 'When viewed edgewise, it looks something like Saturn with his ring, or to use a more homely, but perhaps a more intelligible simile, like a marble set in the middle of a penny.'[32] When describing the veins and arteries of a frog's foot, Wood seizes on a particularly resonant image for a work about curious specimens and natural history: 'The corpuscules go pushing and jostling one another in the oddest fashion, just like a British crowd entering an exhibition, each one seeming to be elbowing its way to the best place.'[33] Wood exploits, then, the play of scale created by the microscope — the geranium petal that encompasses mountains and the snapdragon seed that contains a planet and its rings — to initiate readers into the mysteries of microscopy.

In 1858, three years before Wood's shilling handbook of microscopy appeared, two other handbooks for the microscope, each authored by women, came onto the market: *A World of Wonders Revealed by the Microscope. A Book for Young Students* by Mary Ward (1827-1869) and *Objects for the Microscope* by Louisa Lane Clarke (1813-1883). Both works are examples of juvenile natural history. Ward's volume adopts the familiar format, in which its information is conveyed as a letter to a young friend, 'Emily.' Clarke's handbook 'is written for the young of both sexes; possibly my own daughter has involuntarily guided my pen in writing, to awaken a deeper interest than merely scientific arrangement could give.'[34] In her preface to the first edition of *Objects*, Clarke explains the absence of images as follows: 'There are no engravings, because the mounted objects are the truest and best illustrations...A little expense and a little trouble will procure them all.'[35] By the third edition of Clarke's work (1870), however, colour illustrations have been added; these are the plates that were drawn by Ward for her *World of Wonders*. This is not wholly surprising given that Ward and Clarke shared the same publisher, Groombridge and Sons. The illustrations are unsigned in Ward's 1858 edition, but by the time her work reached its own 1870 edition, she is credited with the designs for the wood engravings. Ward's plates were printed in colour by the letterpress colour printer Benjamin Fawcett (1808-1893).[36] One plate gives us a particularly good idea of the kinds of objects most commonly

Feet of Insects, Petal of Geranium, etc. Plate 13.
1. Foot of Spider, magnified 18 diameters. 2. Claws of Spider, magd. 100 diams.
3. Foot of Fly, magd. 20 diams. 4. Foot of Bootfly, magd. 4 diams.
5. Bootfly. 6. Bootfly floating. 7. Bootfly on the wing. 8 Petal of Geranium.
9. Piece of geranium petal, magd. 8 diams. 10. Minute portion of Petal, magd. 150 diams.
11. Pollen of Clarkia pulchella, magd. 100 diams. 12. Pollen of Crown-imperial, magd. 100 diams.
13. Grain of the above, magd. 300 diams. 14. Pollen of Salvia patens, magd. 100 diams.

Fig. 23.
Magnified objects, Mary Ward, *A World of Wonders Revealed by the Microscope*, 1858.

made into slides for the microscope (Fig. 23). In addition to the geranium petal we encounter in Wood, Ward depicts the foot of a fly, the claw of a spider, and the pollen from various plants. The cryptogams, which were the subject of taxonomical debates during the period, were ideally suited to microscopic studies. As handbooks told readers which fern species to collect, Ward gave readers the tools to examine these elegant plants at home. Of all the plants, she notes it is ferns with which she is most familiar; her drawings of their leaflets and seed-vessels reflect this expertise (Fig. 24). She marvels at the 'prodigious' number of seeds in the Hart's-Tongue fern, which only the microscope can illuminate. By her calculation, each leaf consists of eighty collections of seed vessels. With each collection containing an average of 4500 seed vessels and each vessel preserving fifty seeds, 'a single leaf of Harts-Tongue fern carries no less than eighteen millions of seeds!'[37] The eyes of insects, when viewed through a microscope, could also discover a startling number of objects. A small piece of a dragonfly's eye, Ward writes, is comprised of 220 lenses.[38] Enabling one to see a planet within a seed and millions of seeds within a leaf, the microscope made tangible previously invisible worlds.

Like Wood, Ward relies on imaginative comparisons to instruct

Seed-vessels of Ferns, and Section of Limestone. Plate 14.
1. Seed-vessel of Fern when unripe, magnified 60 diameters. 2. Seed-vessel of Fern, at the moment when the ring straightens itself. 3. Leaflet of Black Maiden-hair Spleenwort Fern. 4. Two sori, or collections of seed-vessels, of Spleenwort Fern, magd. 12 diams. 5. Sorus of Hart's-tongue Fern, magd. 6 diams. 6. Part of a leaflet of Shield Fern. 7. Sorus, magd. 10 diams. 8. Sori of Polypody Fern, magd. 7 diams. 9. Sori and part of leaflet of Hare's-foot Fern, magd. 5 diams. 10. Thin section of Limestone, magd. 19 diams. 11. Group of twenty seed-vessels, natural size. 12. Group of twenty seed-vessels, magd. 6 diams. 13. Leaflet of Polypody. 14. Part of a leaflet of Hare's-foot Fern.

Fig. 24.
Magnified fern samples, Mary Ward, *A World of Wonders Revealed by the Microscope*, 1858.

readers in what they should observe when looking at a specimen. The dark green scales of the Burnet-moth 'are glossy like satin, and the red very bright in colour, but dull like cloth or flock paper'; each one of these scales has rows of 'characters wonderfully resembling some old Babylonish inscription.'[39] The collections of lenses in an insect's eye are like 'the wire-netting that is often put round garden plots to keep out rabbits, just like gigantic lace with holes about the size of half-crowns.'[40] Teaching microscopy by resemblances did not sit well with Clarke, however. She expresses concern, in her preface, that young readers have learnt only the points of comparison for microscopic objects and understand little about the species from which they are extracted. Students repeat that a section of the Echinus spine is 'very pretty, exactly like a crochet pattern' but 'the Echinus itself being an unknown thing.' Citing another example of this limited perspective, Clarke derisively writes, 'the foot of Dytiscus, with its cluster of suckers, is like the eye of a peacock's feather.'[41] Her suspicion of similes is of a piece with her disappointment that microscopic slides are 'hastily looked at, as merely pretty objects, without that knowledge of flower-life which alone enables us rightly to appreciate them.' When slides provide 'mere amusement, for the lust of the eye,' the

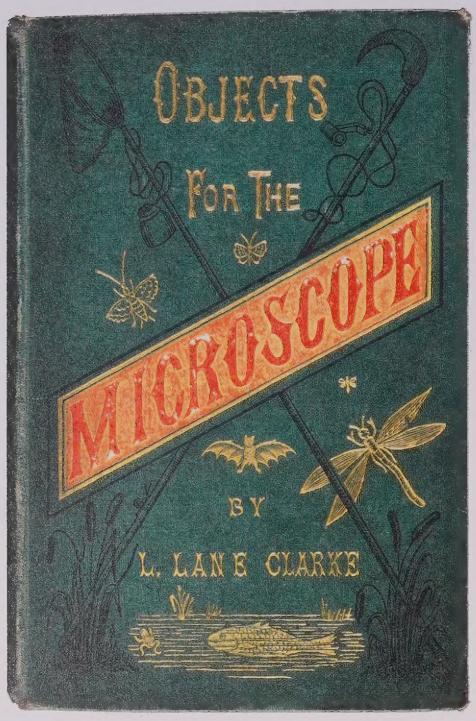


Fig. 25.
Louisa Lane Clarke, *Objects for the Microscope*, 1870, Ruari McLean Collection. With kind permission of Robertson Davies Library, Massey College in the University of Toronto.

microscopic cabinet serves only as a 'toy.'[42] Her volume, aimed at non-medical and young students of natural history, is as steeped in natural theology as those of Wood and Ward. Clarke's route to the 'intricate web of Creation' is simply more rigorously scientific.[43] She began work on *Objects* as a pamphlet to accompany an optician's catalogue of microscopic slides; the publication soon swelled as she sought to include a wider range of specimens and to explain the cellular structure of plants and the anatomy of insects. Zoophytes, algae, and shells receive their own chapters. Which chemicals are usefully observed as they crystallize are enumerated as well. Clarke concludes what has become a treatise rather than a pamphlet with a list of the objects she considers requisite for a 'good education box' for the student of microscopy; these include cuticles of lily, starch grains, a capsule of moss, specimens of fungi, spore-cases of fern, a wing of a wasp, the sting of a bee, and the egg of the breeze-fly.[44] Clarke's handbook, bound in green calico cloth and blocked in gold, showing insects flitting about on its cover, is, itself, a pretty object (Fig. 25). In its liberal use of scientific terminology and its attention to anatomy and physiology, and in its disavowal of resemblances, it departs from the handbooks of Ward and Wood. It is worth noting that as Clarke's guide

moved into its later editions, the scientific focus sharpened as she added a new chapter on anatomical preparations made by injection. We can only wonder what Clarke thought of Groombridge dropping into later editions of her work coloured illustrations by Ward, when Clarke was so firmly convinced from the outset that such engravings only detracted from instruction in microscopy.

Elegant Specimens for Collections

If Clarke decided that her microscopy handbook would not cater to the 'lust of the eye,' other Victorian natural history titles, cheap and expensive, transformed natural phenomena into objects of desire. Printed works, especially those with illustrations, tapped into the consumerist appetites that underpinned natural history pursuits. As Barbara Gates puts it, 'natural history became part of the Victorian rage for materialism and material possessions.'[45] Certain classes of natural phenomena, because of their elegant forms and portability, were ideally suited to being preserved in collections. Lynn Barber has asserted that, by the mid nineteenth century, 'there was hardly a middle-class drawing-room in the country that did not contain an aquarium, a fern-case, a butterfly cabinet, a seaweed album, a shell collection.'[46] Before seaweed could be mounted in an album, it had to be made into a specimen. Larsen reminds us that natural history specimens were always, strictly speaking, artifacts: 'they were manageable pieces of the natural world that could be bought, sold, exchanged, transported, catalogued, displayed, and consulted by many people.'[47] Shilling handbooks, pamphlets, catalogues, and more expensive illustrated works schooled Victorian readers in how to find and to fashion specimens, and in how to preserve these objects in a variety of containers — bookish and otherwise.

The middle decades of the nineteenth century saw the proliferation of handbooks that guided ramblers of the shore to the best seaweeds. With their vibrant colours (reds, greens, and purples), and with their exceedingly intricate forms, seaweeds were ideally suited for translation into the medium of print — in hand-coloured lithographs, nature prints, and natural illustrations. Seaweeds were suitable objects for natural theology; Charles Alexander Johns (1811-1874) published a tiny volume, *Sea-Weeds* (1860), under the auspices of the Society for Promoting Christian

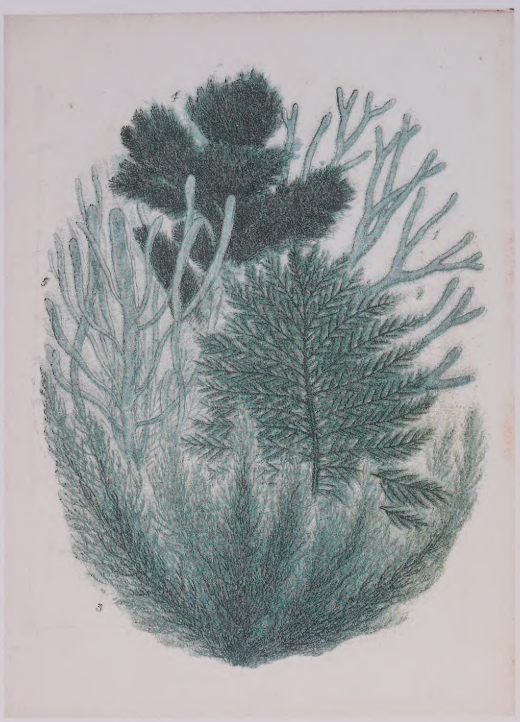


Fig. 26.
Sea-Weeds, Charles Alexander Johns, 1860.

Knowledge. With brightly coloured plates of specimens (Fig. 26), Johns' handbook trained readers in the disciplined observation of seaweeds: '"Not a day without a line,"' is a good motto for a lover of natural history. Write down every day something that you have seen.' A 'perfect' collection will consist of both common and rare species. In addition to exposed rocks, 'the muddy shore' might also yield treasures: 'examine closely every tuft of red fibres which you see lying on the ooze.'[48] Microscopy and algology went hand-in-hand as the complex structures of these cryptogams, as well as the differences between species, were best studied through a microscope. Not surprising, then, is the shilling handbook that Clarke published, *Common Seaweeds of the British Coast and Channel Islands* (1865), for Warne's *Country and Sea-Side Library* (Fig. 27). In pictorial boards, Clarke's affordable volume had 'tinted plates.' Some of these illustrations were nature prints. In the process of nature printing, impressions from natural objects (plants, seaweeds) were made into soft metal. A intaglio printing plate was fashioned from the impression.[49] The plate could then be inked in colour with the original specimen having provided the design. *Nature-Printed British Sea-Weeds* (1859-60), which featured the nature prints by Henry Bradbury (1829-1860), appeared just a few

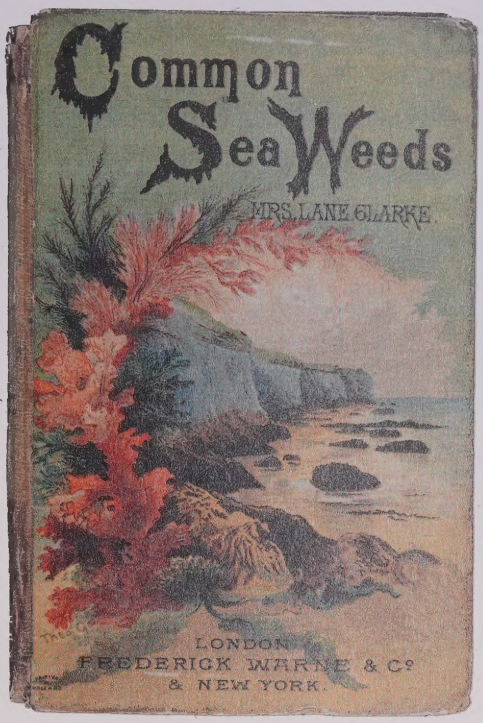


Fig. 27.
Cover, Louisa Lane Clarke, *The Common Seaweeds*, 1865.

years before Clarke's volume (Fig. 28). The image that Clarke relies on to introduce her work is especially resonant: 'taking the coast anywhere as a book, opening and closing as the great sea ebbs and flows, I shall begin with the first-tide pools.'[50] We find in Clarke quite a precise portrait of 'seaweeding': '*We* are going for seaweeds. The tin can is slung over one shoulder, an oilskin bag is at our girdle for smaller and more precious specimens, a pole in our hand to steady our feet, with a hook at one end to lift the tangled masses of rough weed away.' After the seaside rambler has scoured the upper and mid-tide pools for beautiful seaweeds, she should head to the water's edge for additional specimens.[51]

The pretty, spidery forms of seaweeds made them desirable objects for the souvenir albums compiled by seaside ramblers.[52] *The Marine Botanist* (1848) by Isabella Gifford (1825-1891) supplied directions for assembling such an album. After washing, pressing (between sheets of blotting paper and muslin), and drying the specimens, they are ready for their final home in the album. The means by which to attach seaweeds to the page are similar to those used for plant specimens: 'You can either gum the specimens in a scrap book, or fix them in, as drawings are often fastened, by making four slits in the page, and inserting each corner.'[53] Gumming is unneces-

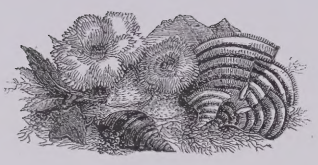
Fig. 28.
Nature print by Henry Bradbury, *The Nature-Printed British Sea-Weeds*, 1859-60.

sary in some cases, Johns points out. Under pressure, some specimens 'will be found to have attached themselves to the paper by their own gluten.'[54] Although Clarke's handbook is also addressed to seaweed collectors, she has little time for the dilettante: 'it is childish *merely* to lay out the pretty bits on paper for an album, and be content with dabbling in the water, as ignorant as a sea-gull of the wondrous and beautiful forms around us. In fact, even as collectors for albums, it is needful to know that the value of your specimens will depend very much on their being *in fruit*; and to discern the fruit we must know where to look for it.' It is the pocket lens, which Clarke tells us can be had for two shillings, and the microscope that will enable the collector to be an 'intelligent' observer of

Fig. 29.
Natural illustration, David Landsborough, *Treasures of the Deep*, 1847.

nature.[55] *Common Seaweeds* distills her knowledge of how to gather specimens that will result in the most useful and attractive album: 'I advise taking *a little* of everything — not much, for they so soon spoil in waiting to be mounted — and name each specimen as they are decided by reference to your manual.' Seaweeds 'thrown up from the deep sea, after the storm' are particularly desirable. Clarke is mindful of the tourist's time constraints: 'If you have but a day for a seaside holiday, go down to the lowest ebb of the tide, in hopes of the best *red* seaweeds, and work back to the commoner, but still beautiful, green seaweeds, *Ulva* and *Cladophora*.' In the half-tide pool, one will encounter species that perform 'such mimicry of flower life as delight the collector, and tint the pages of the album with shades of colour from deepest purple to the rosiest red.' Her use of the term 'tint' reminds us that these albums were illustrated books. As regards *Gigartina Mamillosa*, Clarke writes that 'it does not adhere well to paper, or particularly please us in the album.'[56] If, however, the Victorian reader did not wish to learn how to distinguish one species from another or undertake the elaborate drying and pressing process to ready seaweed specimens for the album, she could simply purchase a preassembled seaweed album with 'natural illustrations.' These were letterpress books, such as *Treasures of the Deep; or, Specimens of Scottish Sea-Weeds* by David Landsborough (1779-1854), which relied on mounted seaweed specimens as illustrations. Specimens in these published collections appear with printed or manuscript labels (Fig. 29).[57] Here, the private seaweed album, compiled by the seaside rambler, finds a new commercialized form.

As the vogue for seaweed waned, Victorian print culture drew the



attention of naturalists to the class of lepidoptera and made these delicate creatures the stuff of collections. The shilling handbook that Coleman authored for Routledge, *British Butterflies* (1860), is a spirited apology for the 'brotherhood of the net.' Addressed to young entomologists and to country ramblers more generally, Coleman presents the study of these 'sunny creatures' as a 'source of healthful enjoyment.'[58] To the 'utilitarians' who inquire after 'the *uses* of butterflies — what they do, make, or can be sold for,' he offers the following retort: butterflies 'are of no more use than poetry, painting, and music — than flowers, rainbows and all such unbusinesslike things. In fact, I have nothing to say in the butterfly's favour, except that...it gives an earnest of a better world.'[59] Following Routledge's usual pricing structure for its *Books for the Country* series, the cheap edition of Coleman's handbook in boards, with sixteen 'plain illustrations' drawn by the author, was available for one shilling. The more expensive version, with wood engravings printed in colour by Evans, cost 'three and six.' Works of entomology and conchology were often based on their authors' collections with borrowed specimens to fill in any gaps. Coleman's 'illustrative portraits' of butterflies 'have been drawn from nature' and 'with one exception from specimens in his own collection.'[60] In economical fashion, multiple specimens appear together in each plate (Fig. 30). A male and a female from the same species might be depicted in a plate, as well as the larger and smaller variety of a species. For Coleman, butterflies are both the subject of his illustrations and the source of his painterly technique. As he puts it, in mounted butterfly specimens, the artist will find 'rich stores of colour-lessons when studied at home in the cabinet.'[61] Though an artist himself, Coleman points to the limitations of the brush when held by the human hand. Whereas even the most beautiful painting, when observed through a microscope, reveals only 'coarse, repulsive daubs and stains,' the 'painting of an insect's wing,' magnified, discovers 'pictures within pictures.'[62] As is so often the case in these works, all roads lead to natural theology. Coleman urges his

Fig. 30.
Colour plate Edmund Evans in William Coleman, *British Butterflies*, 1860.

reader to contemplate how the wings of butterflies are the 'striking illustrations with which the book of Nature has been so profusely enriched by its GREAT AUTHOR.'[63] Apparently even a simple pocket-lens will allow one to glimpse these divine markings.

Like Wood, Coleman feels obliged to address the violence intrinsic to collecting and preserving specimens for the cabinet. His aptly titled section, 'How to Kill a Butterfly,' begins with his acknowledgement that 'this killing business is the one shadow on the otherwise sunshiny picture, which we would all gladly leave out, were it possible to preserve a butterfly's beauty alive.' Since such beauty is fleeting, and 'we have made up our minds to possess that beauty — to collect butterflies,' there is only one way forward for the acquisitive naturalist. The collector's imperative justifies the snuffing out of an insect's life: 'a butterfly's pleasure must be shortened for a few days, to add to our pleasure and instruction, perhaps for a years after.'[64] Convinced that insects do not feel pain, Coleman bolsters his case by citing various instances of what he considers the unnecessary killing of creatures. Hunting for game, fishing to supply the plate with delicacies, killing aphids to maintain the health of plants, and poisoning moths to protect one's furs number among Coleman's exam-

ples. With rhetorical flourish, he pleads, 'are we not also justified in appropriating a little butterfly life to ourselves, and does not the mental feast that their after-death beauty affords us at least furnish an equal excuse for their sacrifice'? Chloroform, cyanide 'killing-bottles,' and a 'quick nip...applied just under the wings' are all means by which to cause 'instantaneous death' to the butterfly one wishes to preserve.[65] Much of *British Butterflies* is given over to describing individual species and their usual time of appearance and locations. The Wood-White butterfly, for example, can be observed on the wing in May and August, in all of Brighton, Epping, Plymouth, Manchester, and the Lake District. Its weak flight makes it vulnerable to capture such that a gentleman in North Lancashire obtained twenty-six specimens 'one morning before breakfast.'[66]

With their strange-looking equipment and questionable purposes, Victorian naturalists could be subject to ridicule.[67] Entomological pursuits, in particular, are best conducted discreetly. Coleman, in his advice to the rambler, balances the use of proper equipment against the risk of appearing odd. While a net fashioned on the umbrella principle constitutes a 'good weapon' in the hunt for specimens, 'some entomologists, nervously sensitive to public opinion' are 'shy of sporting' these items. Should it rain, villagers would expect one with an umbrella-like object to engage it. In fair weather, 'carrying such a protective would seem an equally eccentric whim.' A collapsible cane ring-net, attached to a walking-stick, is convenient for the 'tourist, who may have other matters in hand besides butterfly hunting — perhaps sketching and botanizing — when the larger clap-net becomes quite embarrassing.'[68] In addition to nets and killing-bottles, the entomologist should carry a few pocket-sized wooden boxes lined with cork and a set of entomological pins (Fig. 31). With a pin through its thorax, a dead butterfly is affixed to the cork of the box. Coleman cautions against over stuffing one's box with loose specimens: 'a heap of dead butterflies in a box together will, in the course of a long walk, so jostle together, as to entirely destroy each other's beauty, rubbing off all their painted scales, when, of course, they are as butterflies no longer.'[69]

Upon her return, the rambler must quickly 'proceed to "set" your captures.' The setting process resembles closely that of preparing plants for the herbarium. Coleman's language underscores that both the botanist

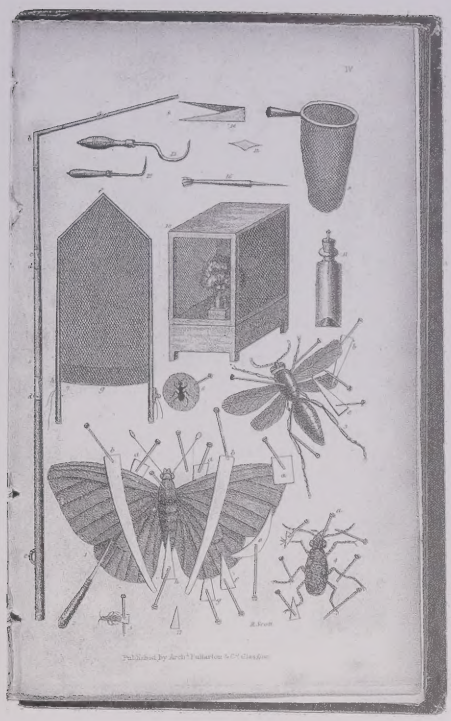


Fig. 31.
Entomology apparatus,
Thomas Brown,
Taxidermist's Manual,
1833.

and entomologist are engaged in preserving ephemeral beauty: 'Any handling of the *wings* is to be avoided, as a touch will sometimes destroy their bloom.' The butterfly specimen must be arranged on a surface (here a setting-board of cork or soft pine) to display its shape as clearly as possible. Once the butterfly is secured to the board, with its wings positioned symmetrically and its antenna carefully preserved, the setting-board must be placed in a dry and dust-free place. After a period of drying, the specimen is ready to be moved into a store-box or cabinet.[70] Shilling handbooks were mindful of the limited means of their readers. Wood, as we will recall, describes how to fashion a microscope out of a strip of card and a little water. In *British Butterflies*, Coleman tells readers how they might economize when setting up their collections. If a cabinet or a ready-made insect store-box is out of reach, 'with a little contrivance, any close-shutting, shallow-box may be extemporized into a store-box.' Since sheet-cork of the kind that shoemakers use in their trade is expensive, 'common wine-corks may be sliced up, and cut into little square patches' and attached to the bottom of the box with gum or another adhesive. Seeking to encourage the aspiring entomologist, Coleman advises that 'the first specimens, the nucleus of the future great collection,' can be

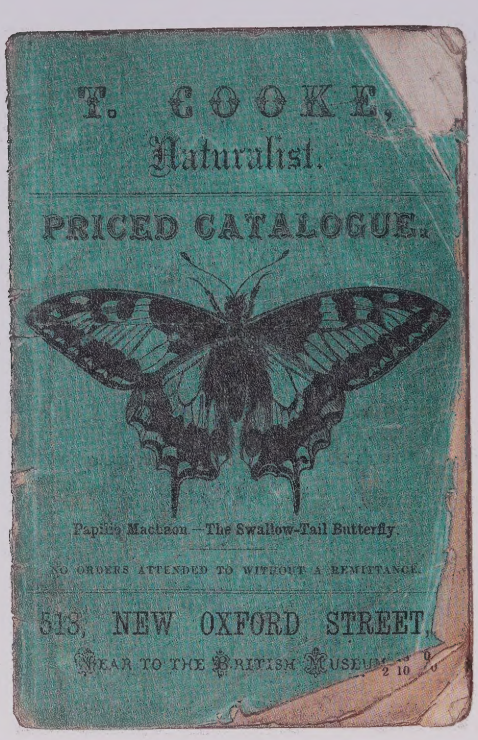


Fig. 32.
Cover of priced catalogue of Thomas Cooke, Naturalist, circa 1880.

preserved adequately in such make-shift boxes.[71] For those without constraints, a bespoke cabinet with drawers made from mahogany or deal (not cedar, which exudes resin onto specimens) is optimal. The drawers should be lined with cork, with *'pure white* paper' pasted onto the bottom. When a system of classification is chosen, specimens should be arranged in columns with male and female examples of each species and with some specimens displayed to reveal the underside of the butterfly. If one obtains a chrysalis of a species, this should be pinned next to the relevant butterfly. A coloured drawing of the caterpillar is also desirable. Small labels giving the species and genus are pinned at the foot of the butterfly.[72] To keep out dust and mites, the cabinet's drawers are covered with glass.

Wishing to spare the budding entomologist the pain of squandering money on unnecessary equipment from unscrupulous dealers, Coleman provides the following personal recommendation: 'I have the pleasure in here giving the name of Mr. T. Cooke, of 30 Museum Street (six doors from the British Museum), where all the apparatus mentioned in this work, are to be found, good and cheap, I believe.' Going one step further in the service of naive 'young amateurs,' Coleman furnishes the prices of

the necessary articles that he, himself, has obtained from Cooke's.[73] The Fisher Library holds an annotated copy of one of Cooke's priced catalogues, which sets before us the retail dimension of Victorian natural history (Fig. 32). Although Cooke receives Coleman's stamp of approval, elsewhere in *British Butterflies*, the author expresses disdain at how London dealers 'style themselves' 'naturalists.'[74] If handbooks, such as that of Coleman and others, wed natural theology to natural history, what Cooke's thirty-six page catalogue (circa 1880) makes clear is that natural history was a business; each of God's creatures could be assigned a price in the market. British birds were sold both in skins and stuffed. A stuffed marsh harrier was twelve shillings, but its skin, just seven. A robin redbreast stuffed was two shillings and its skin, one. A white stork stuffed was twenty shillings and its skin, twelve. If one were preparing stuffed specimens from such birds, a pair of artificial eyes cost a sixpence. A stuffed foreign bird, such as a peacock humming bird or a Baltimore oriole was two shillings.[75] The trade in British birds' eggs was brisk. An egg of the eagle owl was priced at ten shillings but one of the garden warbler, just a threepence. A Greenland falcon's egg sold for one pound.[76] Naturalists were not Cooke's only customers. A 'large assortment' of plumes for hats were stocked, as well as 'real butterflies mounted for Head Dresses &c.'[77]

One section of Cooke's inventory, and the one most relevant to Coleman's readers, is devoted to 'butterflies, sphinges, bombyces, and noctuæ.' The Fisher copy of Cooke's catalogue was likely owned by an entomologist at some point; the pages of the above section contain check marks next to certain items, as well as prices paid. While Cooke's business was selling the Large Copper butterfly for 'two and six,' this collector seems to have paid just one shilling for a specimen. The full price of a sixpence was paid for the Clouded Yellow butterfly. A Lime Hawk moth was obtained for a fivepence instead of six.[78] Cooke's also sold various label lists for butterfly cabinets. An exchange list, which allowed the collector to obtain missing specimens, was available for one penny. Preassembled collections of butterflies were also on offer at Cooke's. For thirty shillings, one could possess a specimen of each British butterfly in a mahogany glazed case. If one wanted a male and female of each species, this came at a cost of three pounds. An assortment of pupa were also 'always on hand in the Autumn' at Cooke's.[79] The catalogue's list of ento-

mological apparatus tells us a great deal about collecting practices. In addition to the stock entomological pins (plain or gilt), ring nets, clap-nets, and umbrella nets, pocket nets with a slide telescope were for sale. For ten shillings, one could buy a folding clap-net 'for beating' shrubs and trees (this method caused insects to fall to the ground). Sugaring tins complete with brush were 'three and six' — smearing posts and tree trunks with a sticky sugary mixture would attract moths. Zinc 'killing and relaxing' pocket boxes were three shillings (the effects of rigor mortis made some specimens difficult to mount without breaking). If one had three pounds, ten shillings, she could simply purchase 'the Entomologist's Store and Setting house'; this kit contained all the necessary equipment to catch and to set lepidoptera in one convenient 20" × 17" × 9" case. Cooke's business had a mail-order component with post office orders payable at High Holborn. Also available were corked postal boxes to enable the entomologist to exchange specimens with fellow members of the 'brotherhood of the net.'[80] Cabinets (in mahogany or polished deal to imitate mahogany), with different numbers of drawers, for storing all manner of natural history specimens were sold at Cooke's. A four-drawer model seems to have been the smallest size and a twenty-four drawer cabinet the largest. If price were not an object, one could also order a bespoke cabinet. Finally, after one had purchased collecting apparatus and a cabinet in which to house one's specimens, one could find at Cooke's any of Routledge's shilling handbooks. Not surprisingly, Coleman's *British Butterflies* (with either plain or coloured plates) is the first item in their book catalogue.[81] A trip to Cooke's shop would outfit the would-be lepidoptera collector with all she needed. What comprised a complete collection of butterflies or moths was made plain by the specimens, lists, and books sold at Cooke's. The space that one's collection took up at home was likewise standardized by the sizes of cabinets available. In Cooke's catalogue, butterflies and moths circulate in the natural history market as commodities to be bought, sold, and exchanged.

Cooke's catalogue helps us to visualize the would-be entomologist in the shop on New Oxford Street (perhaps after touring the zoological collections at the nearby British Museum) purchasing Coleman's handbook and the requisite equipment for heading off on a country ramble (Fig. 33). Three other works held by the Fisher Library take us inside the Victorian home to see how lepidoptera were aligned with ideals of education and

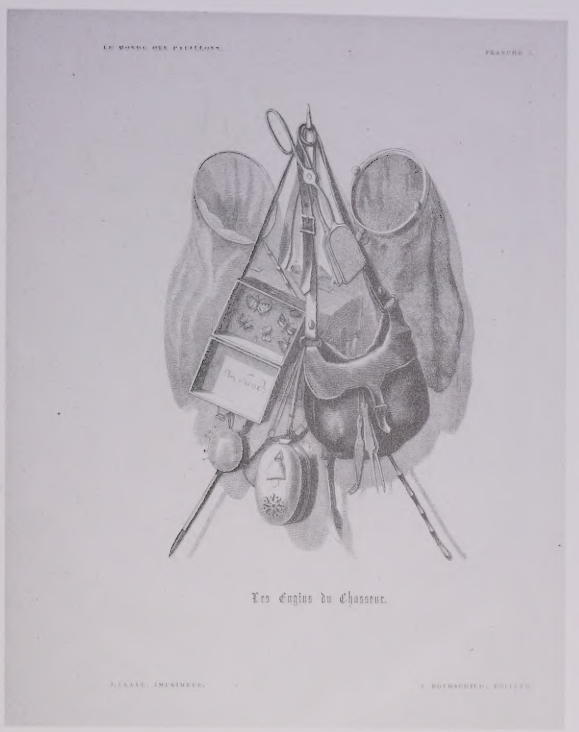


Fig. 33.
Butterfly collector's equipment, Maurice Sand, *Le Monde des Papillons*, 1867.

polite accomplishment, and with the parlour. The example of juvenile natural history, *Mary's Scrap Book. By a Lady* (1838), includes a chapter in which the mother instructs little Mary in insect metamorphosis. While working in the garden, Mary sees a butterfly alight on a flower, which reminds her of a pretty drawing in the scrapbook sent by her aunt (Fig. 34). She wonders what the strange object is near the caterpillar in the drawing that 'looks very like a bee, or a wasp of some kind, without any wings or legs.' Her mother explains that the curious object is a chrysalis and then advises Mary that 'what you call a butterfly, is the currant-moth.' As it turns out, Mary's mother is practiced in entomological observation. She kept the eggs of a moth in a box and then watched as caterpillars hatched from the eggs and fed upon the leaves she had deposited in the box. Through a magnifying glass, she noted the caterpillars' fine silky hairs and tufts. In what follows, Mary's mother teaches her daughter how to distinguish moths from butterflies, and the process by which a caterpillar fashions a cocoon — 'spinning the thread round its own body till it was quite shut up in a little house, not so large round inside as my thimble.' How lepidoptera use a proboscis to reach a plant's nectary is described by Mary's mother, as she delights in telling her daughter about all her 'old

Fig. 34.
Metamorphosis of currant moth, *Mary's Scrap Book*, 1838.

favourites' (species that she has studied) and insect metamorphosis.[82] *Mary's Scrap Book* reminds us that entomology could form part of the domestic education of young women.

The Fisher Library's nineteenth-century manuscript album of original watercolour drawings of lepidoptera (circa 1820s) by a now untraceable 'Miss Parker' reinforces for us the links between entomology and the polite accomplishment of young women. In addition to its illustrations of moths and butterflies, the album contains an index in which different species are listed together with their respective food source. A synopsis of Linnaeus's classes appears on one page. Conventional in private natural history albums was the use of verse to set off their contents. Accordingly, copied onto one of the pages of Miss Parker's album is an anonymous, spiritually uplifting poem about insect metamorphosis. This poem was originally printed in the treatise *Lepidoptera Britannica* (1803) by Adrian Hardy Haworth (1767-1833). These verses continued to appear in periodicals and compilations, such as *The Naturalist's Poetical Companion*, through the century.[83] The caterpillar in this poem serves as an exemplum of patient Christian sacrifice: 'voluntary martyr,' who 'to the tomb, a willing guest descends, / There long secluded in his lonely cell, / Forgets

Fig. 35.
Watercolour of swallowtail butterfly, entomology album by Miss Parker, circa 1820.

the Sun and bids the World farewell.' Time passes until 'when laughs the vivid world in Summer's bloom, / He bursts and flies triumphant from the Tomb.' Only the faithless would not find solace in the caterpillar's resurrection as a butterfly: 'And deems weak Man the future promise vain / When Worms can die, and glorious rise again?'[84] In the meticulous illustrations that follow, species are depicted in their caterpillar and adult (imago) forms on the branches or leaves of their respective food source. Sometimes a chrysalis sits nearby. Miss Parker annotates her delicate drawing of the Clifden moth with the following: 'very rare, feeds on the Ash and Willow.' In her rendering of the Swallowtail butterfly, she writes that it feeds on fennel and rue, and that it is 'the largest and most superb of all the British flies' (Fig. 35).

Her drawings seem to be based on her own observations of species' metamorphoses. Her illustration of the striking Deaths's Head Sphinx includes a note that it changes to a chrysalis in July and that the moth appears in October. Her account of the Goat moth — that the caterpillar 'resides in the trunks of trees, particularly of willows, feeding on the wood' in May — suggests that she undertook rambles of the sort that Coleman would urge later in the century. Also as Coleman would recommend,

Miss Parker has documented the underside of the wings of some of her specimens, such as that of the 'scarce Copper' and the Swallowtail. When her knowledge is limited of the caterpillar form of a species, as in the case of the 'Blues,' she indicates so in her annotations. One note supplies evidence that she, herself, was a collector. Of the 'scarce Silver Line' moth, she writes, 'taken in July.'[85] An extended account, near the end of her album, of the damage that the Carpenter Bee can wreak on the oak tree and the accompanying illustrations indicate that her entomological interests were not confined to pretty specimens. Time, and likely some instruction in drawing, were required to produce such accomplished illustrations of moths and butterflies. Miss Parker demonstrates knowledge of Linnaeus's classes, even though she relies in her album on common names of species. The presence of an index in the album points to its use as a reference work. Given the detail of these drawings, and that some show the underside of species, one imagines that the artist had preserved specimens from which to work. When we think of nineteenth-century women and their natural history albums, the focus usually rests on herbaria, botanical paintings, and seaweed scrapbooks. Miss Parker's lepidoptera album expands our view of these private compilations that could preserve scientifically accurate and pleasing depictions of common and more rare British species.

In different ways, each of *Mary's Scrap Book* and Miss Parker's album valorize first-hand observation as the basis of entomological study. Mary's mother will give her daughter the same kind of 'little box' in which she kept live insects for study purposes; Miss Parker's drawings reflect her own encounters with lepidoptera in the field. These works also evoke the domestic setting in which young women were taught about lepidoptera and learned how to translate this knowledge into visual form. A work by the naturalist and illustrator Henry Noel Humphreys (1810-1879), *The Butterfly Viviarium* (1858), moves us more explicitly into the Victorian parlour.[86] The subtitle of this elegant volume is *Being an Account of a New Method of Observing the Curious Metamorphoses of Some of the Most Beautiful of our Native Insects*. What little Mary learns from her mother and what Miss Parker documents in her album can all be understood, asserts Humphreys, from the comfort of one's 'own study or drawing-room.'[87] Written as a companion to his successful *Ocean Gardens: The History of the Marine Aquarium* (1857), Humphreys taps into the

Fig. 36.
Frontispiece, Henry Noel Humphreys, *Butterfly Vivarium; or, Insect Home*, 1858.

fashion for live specimens preserved in glass cases. Until 1845, Victorians were subject to a not inconsiderable glass tax. The lifting of this excise is often cited as a factor in the proliferation of certain items associated with natural history inquiries including glass jars for collecting insects, aquarium tanks, Wardian cases, and greenhouses.[88] *The Butterfly Vivarium* imparts Humphreys' design for a new type of 'miniature conservatory' in which the 'world of insects' will be 'made to exhibit its wonders as conveniently and instructively as those of the *Algæ*, and *Zoöphytes*, and *Molluscs*...have been shown in a well-ordered Aquarium.' Though in its principles, this invention does not differ greatly from current 'rude breeding cages,' what he offers to readers is an 'insect home' that is, itself, 'an ornamental drawing-room object' (Fig. 36).[89] According to the author, shilling lectures have given individuals only a 'vague kind' of knowledge of caterpillars and metamorphosis. Having found entomology a pleasant study, he hopes *The Butterfly Vivarium* will 'tempt others to seek their holiday amusement in a similar course of research and observation.' Humphreys' work is notable for how it eschews the natural theology so characteristic of Victorian natural history: he will avoid 'that continual straining after the discovery of specially providential arrangements in

matters which do not seem to require that kind of interpretation.'[90] In emphasizing how 'convenient' his invention is, Humphreys aligns his butterfly vivarium with other consumer goods which promise to save time and to provide pleasure. The 'entomological student, busy with household cares or with the continual calls of some all-absorbing profession,' simply cannot be expected to follow in the footsteps of the great entomologists who spent 'weary hours, and days and nights by the haunts of the insects whose habits they were studying.'[91]

At the back of Humphreys' volume is an advertisement by Messrs. J. & W. Sanders for a range of butterfly vivaria; their cheapest model sells for three pounds. For readers with more limited means, Humphreys provides instructions in how to build one of these cases.[92] The May 1858 issue of the *Literary Gazette* carries a notice for Humphreys' new publication that suggests that its readers probably did not overlap with the audience for shilling lectures. With several hand-coloured engravings, *The Butterfly Vivarium* sold, in cloth, for seven shillings and a sixpence; the volume was advertised as 'a New Amusement for Summer.'[93] One review, in *The Spectator*, is skeptical about the author's assurance that his butterfly vivarium is 'as easy to keep as an aquarium....we suspect that the insects require minuter care and closer observation than the piscine tribes.'[94] Thus, while Humphreys describes how the collecting of items for the butterfly vivarium 'will form a very fascinating recreation for all such as delight in a ramble through the fields and woods,' its price and the labour associated with setting up this collection would have put it out of reach for many.[95]

Humphreys' design for the butterfly vivarium seeks no less than to accommodate the aesthetics of the picturesque to the conditions of scientific observation. In his well-ventilated 'little crystal palace,' where both aquatic and land insects will be reared, the land rises 'from the level of the water, like the seats of an ampitheatre.' 'A few irregular pieces of moss-covered stone' will create the effect of undulation. 'Tasteful rock-work,' and 'pretty pebbles' or sand sprinkled with watercress-seed 'will produce the effect of a small submarine lawn or grass-plot.' 'Ornamental ferns' and other plants for the feeding of caterpillars will be supplied with water through concealed tin or zinc tubes implanted in the earth of the tank. Small plants in flower, placed in pots, will be sunk into the soil. Above water-level, the nectaries of their blossoms will provide nourishment for the butterflies 'during the short time that they can be preserved

Plate II.
1. Vanessa Io—The Peacock Butterfly.
2. The Caterpillar of the Peacock Butterfly.
3. The Chrysalis of the Peacock Butterfly.
4. Polyommatus Alexis—The Common Blue Butterfly.
5. The Female of the Common Blue Butterfly, showing the underside of the wings.
6. A singular variety of the Common Blue Butterfly, with the wings of both sexes.
7. The Caterpillar, and 8. the Chrysalis, of the Common Blue Butterfly.

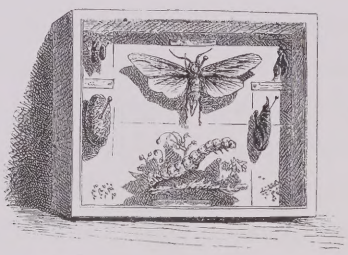
Fig. 37.
Plate with specimen of *Polyommatus Alexis*, Henry Noel Humphreys, *Butterfly Vivarium; or, Insect Home*, 1858.

in the Vivarium.'[96] To illustrate how one should organize one's vivarium, Humphreys uses the example of the Purple Emperor butterfly. Should one collect a specimen of its larvae during a ramble, since this species feeds on the oak or elm, it is essential to 'keep a sprig of Oak continually fresh and green in the Vivarium.'[97] In order to ensure that the water is pure and free of dead vegetation, various snails should be introduced into the 'miniature lake.' 'The graceful little fish' — sticklebacks — will 'give an appearance of life and movement to the water.' Larvae of dragonflies, gnats, and water beetles will all provide 'spectacles' for the naturalist.[98]

Humphreys brings home the challenges faced by the naturalist during the publication process. In the explanation for Plate II, he recounts a anecdote in which his entomological expertise is undermined during the process of book production. The plate in question depicts the species *Polyommatus Alexis*, which is an instance of gynandromorphism (having both male and female characteristics) (Fig. 37). Having collected a specimen of this butterfly, himself, and having encountered other examples at the British Museum, he prepared a drawing of the butterfly that had the 'azure wings of the male' on one side of the body and 'the dusky brown ones of the female' on the other. The wood engraver for *The Butterfly*

Vivarium sent the block for the plate back to him 'when half engraved, with a note stating that I had forgotten to finish one pair of wings of the small Butterfly No. 6.' In another article he published on this species, the engraver did not even consult Humphreys and simply ordered a draughtsman to render the wings identical.[99]

If Humphreys' butterfly cabinet promises a means by which to observe living creatures in the process of change, the products of his ornamental breeding case seem destined all the same for the naturalist's collection of dead specimens. When, after much anticipation, the owner of the vivarium finds that the Purple Emperor butterfly reached its perfect state, he must be prepared for the creature to attempt to flee: 'for more than a day or two it will be impossible to keep the prisoned Emperor within the narrow limits of his cell, however attractive it may be made; so that he must either be remorselessly secured for a collection of dry specimens, or allowed to take his free flight to the woods.'[100] The image of the ampitheatre is apt for the contrived drama that Humphreys stages within his glass case. Sprigs of oak and elm are the scenery as insect larvae are made to perform metamorphoses for the hungry gaze of the naturalist.



In portraying his butterfly vivarium as a 'drawing-room object,' Humphreys evokes the range of glass contrivances, associated with natural history, that populated the Victorian parlour. For Thad Logan, glass objects that displayed elegant specimens were 'manageable little [worlds]' that reinforced Victorians' sense of 'mastery over the created world.'[101] Shirley Hibberd (1825-1890), one of the most prolific horticultural writers during the period, brings into focus the ways these decorative objects were embodiments of Victorians' ability to mobilize and to re-stage nature. In his popular work, *Rustic Adornments for Homes of Taste* (1856) (Fig. 38), Hibberd makes requisite the presence of such objects in the well-appointed home: 'Who would live contentedly, or consider a sitting-room

furnished, without either a Ward's Case or an Aquarium?'[102] Markers of taste, Wardian cases (near airtight enclosures for live plants) and Warrington cases (combination aquaria and fern cases) were stocked with specimens brought home by the country and seaside rambler. Much of the print apparatus for Victorian natural history, as we have seen, focuses on how to preserve specimens for collections. The language that Hibberd uses to describe the Wardian case signals that these glass enclosures were implicated in additional forms of preservation. As Hibberd explains of the Wardian case, 'we obtain...in the isolation afforded by the glass covering, a climate within a climate, a little world within a world, in which, while their wants are satisfied, the plants enjoy an immunity from external disturbing influences.'[103] Hibberd's reference to the 'disturbing influences' from which the tenants of Wardian cases require protection points to the environmental conditions associated with the invention of the Wardian case by the surgeon and botanist Nathaniel Bagshaw Ward (1791-1868) earlier in the century. While Ward communicated his design for closed cases for the transportation of live plants in periodicals as early as the 1830s, he did not publish an extended account of his design, *On the Growth of Plants in Closely Glazed Cases*, until 1842. With the repeal of the glass tax in 1845, the conditions were favourable for the more widespread adoption of Wardian cases within the Victorian home. As these glass enclosures became more affordable, some of the applications that Ward had staked out early on for his plant cases became more pressing. In large towns, he noticed, 'sooty particles diffused through the air, [interfere] with the respiratory functions' of the leaves of plants and thus depress their growth. Ferns could thrive in his cases because they were protected from this 'fuliginous matter.'[104]

If his cases might protect plants from pollution, Ward also envisioned their use as a 'natural' window covering: 'These cases form the most beautiful blinds that can be imagined, as there is not a window in London that cannot command throughout the year the most luxuriant verdure.' While these botanical blinds will lift the spirits of those 'who have not the opportunity of visiting the country,' Ward also imagines his cases as instruments for beautifying smoky cityscapes. Through the use of his natural blinds, London or any other large town, 'might be converted into one vast garden.'[105] Along with Hibberd, John Mollison (fl. 1870s) did much to popularize Wardian cases in his *New Practical Window Gardener*

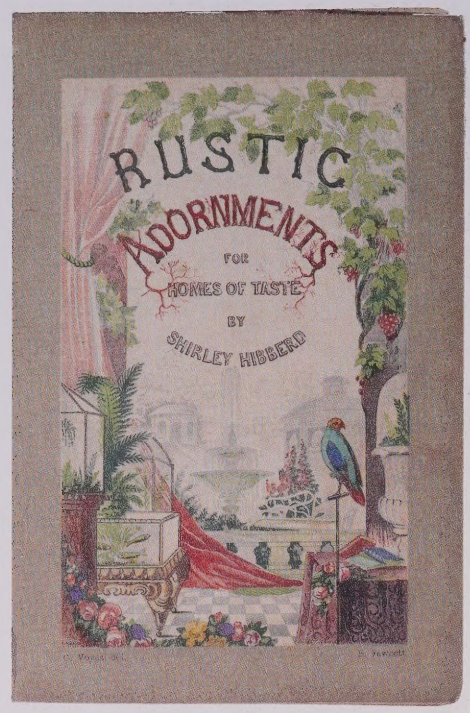
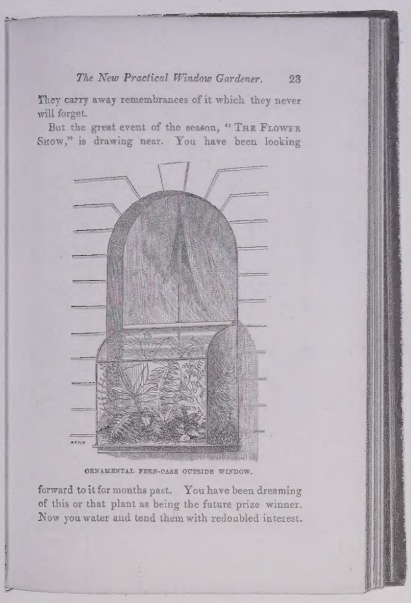


Fig. 38.
Colour wood engraving, title page, Shirley Hibberd, *Rustic Adornments for Homes of Taste*, 1856. Ruari McLean Collection. With kind permission of Robertson Davies Library, Massey College in the University of Toronto.

(1877). Mollison follows in Ward's footsteps in linking these plant cases to social improvement and deteriorating environmental conditions in towns: 'Every one delights in possessing a flower, from the poor in the back lanes of the city, who treasure their one little plant, struggling for existence in the poisoned atmosphere.'[106] One of the illustrations in Mollison, of a fern case placed outside a window (Fig. 39), allows us to see how Ward's invention might provide pleasant views for the city-dweller hurrying along smoke-filled streets. The need for a 'climate within a climate,' to use Hibberd's language, was becoming more urgent both for human and non-human inhabitants of the Victorian world.

The paradox of home decoration manuals such as those of Hibberd and Mollison, which schooled readers in how to bring the 'freshness' of the 'green world' inside their dwellings, is that they were implicated in the decline of the very species they valorized.[107] Manuals for collecting native British ferns had been available since the 1830s. The ascent, in the middle of the century, of the Wardian case, in which such species grew especially well, unleashed what is now known as the Victorian 'fern craze.' To take just one example of a popular fern manual, in 1860, Thomas Moore (1821-1887), published his shilling handbook for Routledge, *British Ferns and*



The New Practical Window Gardener. 23

They carry away remembrances of it which they never will forget.

But the great event of the season, "The Flower Show," is drawing near. You have been looking

ORNAMENTAL FERN-CASE OUTSIDE WINDOW.

forward to it for months past. You have been dreaming of this or that plant as being the future prize winner. Now you water and tend them with redoubled interest.

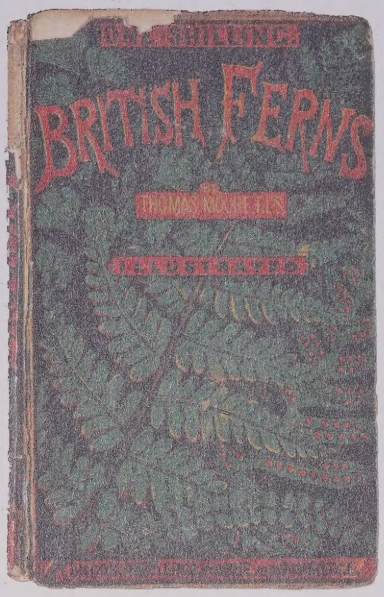


Fig. 39. Exterior fern case, John Mollison, *New Practical Window Gardener*, 1879.

Fig. 40. Cover, shilling handbook, Thomas Moore, *British Ferns and their Allies*, 1860.

their Allies (Fig. 40). This guide helped to make of ferns drawing-room objects. Because of their 'exquisite elegance,' ferns have 'become fashionable.' Moore reassures readers that ferns are 'very easily cultivated' and, of all plants, 'the best adapted to parlour or window culture.' Preserved in a Wardian case, ferns 'acquire more than their natural delicacy of appearance.'[108] Like seaweeds, ferns became only more curious when placed under the microscope; their haunting shapes made them suitable for mounting in albums and for nature printing. A couple of decades later, Mollison urges his readers to embrace the Wardian case and to spend their 'holiday' 'going Fern-hunting in the country.'[109] Elsewhere in his volume, though, he registers a critique of the over-collecting of ferns. By this time, as David Allen has shown, the damage to fern species by plant-hunters was well-known.[110] Mollison tells of 'the rambling tourists [who] often commit wanton destruction, unthinkingly pulling up the rare and beautiful little Ferns in handfulls to please a passing whim, or to have remembrances of their visit to the locality.' Those merely seeking souvenirs, should 'let the poor Ferns grow in their own quarters.'[111] Each in their own turn, seaweeds, ferns, and orchids were subject to over-collecting by Victorians as the search for more and more 'rare' specimens, to enclose in glass cases and to affix to the pages of the album, continued unabated for decades.

Chapter Four: Women in the World of Victorian Botany

Women's sustained participation in the world of Victorian botany took many forms. If, as Ann Shteir has argued, the question of who should study botany (men or women) and why (for scientific, utilitarian, or pleasurable purposes) became increasingly contested after 1830, what the Fisher Library's rich holdings in this area demonstrate is that women, during the 1830s and beyond, worked as authors and illustrators of botanical publications, compiled private albums of flower paintings and botanical observations, and advanced knowledge of particular species through field work and cultivation.[1] Within the home, women also educated their children in botany, and served as drawing and painting instructors in botanical art. Inasmuch as some authors, in a bid to claim scientific authority, sought to sharpen distinctions between 'amateur' and 'professional' botany, in practice, this boundary was more permeable. The recognition that taxonomical projects and the production of guides to local flora depended upon the botanical observations of far-flung individuals, most of whom did not have affiliations in learned societies or any professional status, meant that some women were well-poised to contribute to such endeavours. At least since the eighteenth century, flower painting and drawing were deemed suitable past-times for women and signs of polite accomplishment. A logical pathway thus existed for nineteenth-century women to become illustrators of botanical treatises and magazines.[2] Although not all women flower painters were engaged in taxonomical projects and conducting plant dissections with microscopes, it would be a mistake to divorce their work as illustrators (and that of Agnes Chamberlin in nineteenth-century Canada) from the science of botany. In her account of nineteenth-century botanical illustration, Anne Secord delineates the reciprocal relationship between the creating of pleasing images of plants and the honing of observational skills. The production of such images was usually the result of careful observation of specimens, either in herbaria or in the field, and the circulation and consumption of such illustrations might train students and other potential practitioners of botany in precise scientific observation.[3] Whether made for private purposes or for the print market, whether anonymous or by well-known authors, botanical works by Victorian women display an engagement with the natural world and a facility for translating plants into new visual and textual forms.

Fig. 41.
Frontispiece,
Elizabeth Perkins,
Elements of Drawing and Flower Painting,
1834.

An 'Elegant Art'

The nineteenth century saw the proliferation of botanical drawing manuals, many of which were aimed at novices and at women. A botanical drawing book by Elizabeth Steele Perkins (circa 1830), *Elements of Drawing and Flower Painting* (1834), negotiates gender expectations as they related to botany (Fig. 41). Tipped in to the Fisher copy of Perkins's manual is a note dated 29 August 1833, in which Perkins receives permission to claim royal patronage for the work. The introduction that Perkins pens for her manual appears critical of gender roles: 'Though "mind has no sex," yet the usual and necessary forms of society restrain females from many pursuits which are open to the competition of the other sex.' Still, one should find some consolation that 'the unbounded field of nature and the elegant resources of art are, to a considerable extent, open to [women].'[4] Other obstacles have stood in the way of would-be botanical artists: the theory of phrenology and other 'peculiar opinions on the subject of genius have discouraged many from the practice of the elegant arts.' Genius, Perkins asserts, 'perhaps is nothing more than a strong love

for any science or art, or branch of knowledge, accidentally excited, but strengthened, matured, and refined by industrious and careful cultivation.'[5] It is difficult to gauge whether Perkins is genuinely dismayed by societal gender roles that excluded women from particular fields of study or whether the author is skillfully exploiting such gender expectations to secure her female readership. In a work that emphasizes industry, practice, and acquired skill, it may merely have been expedient for Perkins to attack theories of genius. Certainly, Perkins, herself, portrays botany in gendered terms: 'it is surprising an art so beautiful and feminine as that of flower-painting is so little practiced.'[6]

If Perkins's sensibilities are not always easy to discern, her attacks on current methods of instruction in botanical art are unqualified. Those who work from 'the miserable caricatures of [Nature's] beauties which the shops furnish for the imitation of the pupil' will never hope to produce excellent paintings.[7] This practice of 'copying from a copy,' rather than from Nature itself, has led to the abysmal quality of current botanical publications: 'there is not before the public more than two botanical periodicals that in point of coloring are passable.'[8] One assumes that the *Botanical Magazine*, begun in 1787 by William Curtis (1746-1799) and directed by William Jackson Hooker after 1815 was among Perkins's two 'passably' coloured periodicals. At the time that Perkins was writing, Paxton's *Magazine of Botany*, published by the botanist Joseph Paxton (1803-1865), was also putting out issues with precisely coloured plates. Teaching her pupils to take only Nature as their 'model,' Perkins viewed her course of flower painting as an effort to improve the state of botanical publishing and, perhaps, even to train women for such employment.[9] During this period, women flower painters contributed illustrations to Curtis's *Botanical Magazine* and to other botanical publications.[10]

Throughout Perkins's manual, there is a deliberate blurring between women and the objects of their botanical art. This identification between flowers and women who paint them is present in such lines as, 'in Nature...all is elegance, grace, softness, and beauty,' and in Perkins's instructions to the student to assume a 'graceful position' when sitting down to draw; one's hand should never be 'forced' into 'an inelegant and improper position.'[11] Perkins eschews the use of that 'expensive cumbrous, and old-fashioned appendage, *a table* drawing-board.' Her method is more economical, but one wonders if such a drawing-board would also

mar the graceful profile of the botanical artist that she advances. A larger theme in Perkins's *Elements of Drawing* is restraint. The second chapter of her manual advises that 'the pupil should not be in haste to advance to the use of color.'[12] After honing one's skills with the pencil, one may proceed to the plates of 'skeleton leaves.' Before copying these plates, the student must 'obtain a freshly picked leaf' of the kind of each of the skeleton leaves and conduct comparisons between the specimen and its skeleton. In time, the student can proceed to copy the plates onto tracing-paper.[13] One has to wait until the fifth chapter of Perkins's manual to encounter advice on the use of colour. Here the pupil learns how to use 'Hooker's greens' — so named after the pigments for leaves created by the botanist Hooker. Only four of Hooker's greens are 'requisite for botanical purposes, [and] may be rendered opaque by an admixture with flake white.'[14] A discussion of pigments, with colour charts, is followed by a section on how to hold one's sable brush.[15] Finally, the pupil comes to a section, 'On beginning to Paint Leaves from Nature,' where she learns first how to outline a leaf in pencil and then to take no more than a third of a brush of the 'lightest shade of Hooker's greens prepared thin.'[16] The painting of a flower's blossoms requires equal patience — 'every blossom must first be shadowed in its darkest parts with a very slight shade of India ink, and then gradually brought up to the *color* of the object to be copied.'[17] Even after the pupil has learned how to apply colour, Perkins urges restraint should she begin to entertain thoughts of painting 'the *tout ensemble* of a furnished vase.' For the author, 'this mode of grouping, though striking, is not judicious. It is countenanced by fashion, *not by taste*.' Such 'artificial' bouquets embody the same lack of discipline that characterizes the pupil who applies colour before outlining a leaf.[18] Perkins follows her written text with a series of plates of partial outlines and of skeleton leaves and blossoms. Two coloured plates — one of the anemone and another of the scarlet geranium — appear after their skeleton images. As an appendix, Perkins includes a calendar of 'ordinary garden plants' in their common names; the plants are listed by the months of their blooming.

Two items held by the Fisher Library — an anonymous album of watercolour drawings of the plants in a Yorkshire garden and an illustrated work of botany by Margaret Roscoe (1786-1840) — testify to the appeal of organizing one's botanical plates according to the seasons. For the purposes of identification, the arrangement of British flora found in

Fig. 42.
Watercolour drawing, album, 'Flowers from our Yorkshire Gardens,' 1880-86.

handbooks usually followed Withering's Linnaean system. When, however, one came to drawing or painting the plants in one's own garden or in the countryside, the most logical method, as Perkins suggests, was to proceed according to the seasonal calendar. From 1880 to 1886, an anonymous artist made watercolour drawings of the plants in her (or his) Yorkshire gardens (Fig. 42). In this elegant album, entitled simply, 'Flowers from our Yorkshire Gardens,' 134 plants are depicted. Most are identified by their Latin names and the month and year of flowering recorded. The drawings seem to have been made in pencil first and then washed with some colour. While most pages show one plant against a white background, in some cases, the artist has provided two different drawings of

the same species. Among others, the album preserves illustrations of anemones and gentians, irises and peonies, geraniums and chrysanthemums, the dogtooth violet, the Canadian violet, phlox, saxifrage, sedum, and asters. It is difficult to discern much about the class or even the gender of the artist. The use of Latin plant names suggests some education in botany and the number of drawings points to the artist's time for leisure or recreational activities. The variety of the species represents more than the most simple garden but not the rarities of the great Victorian plant collectors.[19] Neither do we have the range of species necessary to create, for example, elaborate monthly colour schemes.[20] The precision of the colours and outlines in some of the drawings reflect training in botanical art or, at least, the use of such drawing manuals as that by Perkins or others. By the subtle tones of the plants' leaves, the anonymous artist appears well-versed in Hooker's greens. Assembling a private album of one's portraits or landscapes was a well-established Victorian practice, especially for middle and upper-class women.[21] The Yorkshire garden album was shaped by seasonal rhythms — a private compilation likely bound up with the artist's own gardening activities and domestic life.

Natural rhythms structure Roscoe's important contribution to Victorian botany, *Floral Illustrations of the Seasons, Consisting of The Most Beautiful, Hardy and Rare Herbaceous Plants, Cultivated in the Flower Garden* (1831).[22] Dedicated to her father-in-law, the botanist William Roscoe (1753-1831), Margaret Roscoe's work is addressed to women readers. She hopes to 'be the means of encouragement, particularly among her own sex, to a taste for botanical pursuits.' In what became an established trope for women authors of botanical works, Roscoe downplays her own expertise. As she puts it in her dedication to William Roscoe, she is 'not presumptuous enough to believe that I can offer anything novel in a botanical point of view,' and characterizes her 'effort' as 'feeble.'[23] With plates designed after her own botanical drawings, however, Roscoe exemplifies botanical accomplishment. At pains to demonstrate that it is piety and not scientific ambition that underlies her volume, Roscoe imbues her work with natural theology: 'in the structure of every plant, we shall find the most exact symmetry, and the most perfect contrivance — and the more minutely we examine, the most decided traces we discern of that Power.'[24] If, though, to her father-in-law she claims that her work is nothing 'novel,' when she speaks to readers through her preface, she

acknowledges that she has, in fact, 'aimed at some novelty in the [work's] design.' *Floral Illustrations* has twin objectives as regards its women readers: '[that] it may prove a useful and correct guide to their tastes, both in their selection for a flower garden, and as objects for their pencil.'[25] By evoking the image of her female audience sketching the plants that she recommends they cultivate in their gardens, Roscoe shrewdly positions her volume as both a drawing manual and a gardening treatise. In her use of the term 'taste,' she aligns *Floral Illustrations* with other botanical publications that associate plants with fashion and refinement. Perkins, as we will recall, encouraged her students to assume a 'graceful position' while drawing the graceful objects of nature. Roscoe relies on a similar strategy, here, in which the cultivation of an elegant plant is the cultivation of one's own elegance. A combination of hand-coloured engravings and aquatint plates, *Floral Illustrations* is, itself, a tasteful object for the Victorian parlour.

Roscoe's book is an illustrated form of the garden calendar that Perkins appends to her drawing manual. But whereas Perkins begins with the month of January, Roscoe chooses the season of spring and the yellow crocus (plate 1) to inspire her readers to create 'beautiful displays' in their gardens.[26] Poetic extracts, from James Thomson (1700-1748) and others, serve as epigraphs for each 'season' of Roscoe's treatise. Species are organized according to Withering's classes, with their Latin and common names given. After a botanically accurate account of a species, Roscoe furnishes advice about its cultivation and the role that the plant should play in the design of one's garden. Writing in 1831, Roscoe, like Parr Traill in those early years in Canada, had only Frederick Pursh's flora of North America to cite as an authority for such species as the common blue hepatica (plate 2) and the common dog's-tooth violet (plate 5). Roscoe's accounts of individual species are notable for their attention to the date of introduction of the species in England and to their success when propagated by seed. The fine-leaved peony (plate 17), a native of Siberia, we learn, was introduced into England in 1756 and can be raised by seed (Fig. 43). Phlox are depicted in the anonymous 'Flowers from our Yorkshire Gardens' album from the 1880s. In Roscoe's entry for phlox (plate 18), we are told that it is a native of the mountains of Virginia and was introduced into England by the Scottish botanist and plant-hunter John Fraser (1750-1811); one of its varieties is particularly suitable for rock-work.

Fig. 43.
Peony, Margaret Roscoe, *Floral Illustrations*, 1831.

Botanical periodicals and catalogues fed Roscoe's accounts of species; her entries are cross-referenced to issues of Curtis's *Botanical Magazine* and the *Botanical Register*, and to the numbers of Loddiges's *Botanical Cabinet*. The entry for broad-leaved meadow saffron (plate 42) is typical of Roscoe's approach. One cannot find 'a greater ornament to the flower garden' in the autumn than this species. Following a precise account of the plant's structure, in which its leaves are described as 'broadly lanceolate, plicate, [and] smooth,' Roscoe recounts the journey of its bulbs from Constantinople to Vienna to England. She reassures her readers that meadow saffron is 'perfectly hardy' and, lending her entry the quality of an herbal, Roscoe refers to the plant's famous medicinal properties. At once, then, Roscoe establishes the desirability and exotic nature of the species, while putting it within reach of her Victorian reader. A significant contribution to the visual culture of Victorian botany, Roscoe's *Floral Illustrations* shows the logic and appeal of works organized by season.

Three publications by women focus our attention on the nineteenth-century market for popular works of botany, specifically, those framed as family narratives. Usually structured as a series of fictional conversations or dialogues, such works assigned maternal figures the task of teaching young people botany. As Greg Myers has argued, such fictional popularizations of science helped to 'define the groups that [were] outside science.'[27] Even if these works tended to limit the spheres of women's scientific inquiries, they did, as Barbara Gates has demonstrated, inscribe women figures as experts.[28] *Conversations on Botany* by Sarah Mary Fitton (?1796-1874), in which a mother instructs her young son Edward in Linnaean botany, was first published in 1817 and passed into its ninth edition in 1840. Evidently, Fitton's work found its implied male readership. The title page of the Fisher copy of the 1831 edition of the *Conversations* bears the following gift inscription: 'Grandpa's present to John Higgins Allen, 1849.' It was not unusual to receive Fitton's book as a present from one's grandfather, as the Fisher copy of the 1834 (eighth edition) also records such a gift inscription. On 11 July 1837, a young James Dalton (?-1862) received Fitton's *Conversations* from 'his affectionate Grand-father' — the Reverend James Dalton (1764-1843), Rector of Croft at Yorkshire. The elder Dalton, himself, was a naturalist and contributor to James Edward Smith's *English Botany*.[29] In addition to a course of botanical study for his grandson, the Reverend Dalton would have found in Fitton's *Conversations* the sentiments of natural theology. As Edward's mother tells her charge in Fitton's book, 'the naturalist meets with endless variety; and at every step he discovers beautiful contrivances in the works of nature, which escape the attention of common observers.'[30] 'Contrivances,' as we have seen, pointed to God's handiwork and signalled to Victorian readers that a publication would have 'reading the book of nature' as its pious goal. In another example of a botany book in the dialogue or conversation genre, *Our Wild Flowers Familiarly Described and Illustrated* (1839), by Louisa Anne Twamley (1812-1895), Aunt Lucy and her niece Agnes undertake 'rambles' in the English countryside with a 'tin box for specimens.'[31] Like Fitton, Twamley links botany and piety at the outset of her book: 'I am as fond of flowers as any one can be; they are the darlings of Creation in my eyes.'[32] The poetic extracts that she sprinkles

liberally throughout her narrative, not least verses by Bishop Richard Mant (1776-1848), reinforce the devotional themes of her work.[33] The presence of natural theology within the works of Fitton and Twamley should be seen, to some degree, as their exploiting of a ready market for such books.

Organized in eighteen conversations, Fitton's work ranges over native and foreign species in order to illustrate each class of plants; the medicinal and economic uses of species are also detailed in the *Conversations*. Like Withering's volumes before her, Fitton's book includes a guide for the pronunciation of Latin plant names. While the mother in Fitton advises Edward that Withering's *Arrangement of British Plants* 'is one of the best books that you can refer to, until you have learned Latin,' she nevertheless laments that Withering chose to redistribute four of Linnaeus's twenty-four classes among his other nineteen. Edward will therefore be instructed in all of Linnaeus's original classes, at the prospect of which he quite reasonably confesses to his mother, 'I am afraid I shall never remember the distinctions of all these classes.'[34] His mother is unsympathetic: 'When Linnaeus was about to publish one of his most celebrated works, he examined the characters of eight thousand flowers: so that you may judge how very industrious he must have been. If you are attentive, and try to remember what I tell you, I think that at the end of a month you may be able to examine the flowers you meet with in your walks, without my assistance.'[35]

Indeed, Linnaeus was held up as a heroic exemplar in nineteenth-century popular works of botany aimed at young boys. In what might have served as a model for Fitton's work, *A Sketch of the Life of Linnaeus. In a Series of Letters Designed for Young Persons* (1827), a fifteen-year-old Henry Vernon is advised by his father that the study of botany is requisite for a medical career. The narrative frame of *A Sketch* both reinforces and troubles nineteenth-century gender stereotypes associated with botany. The book opens with Henry mocking his sister Ellen for her botanical studies, while at the same time bringing her a new "flower to pull to pieces.' He has 'taken some pains to procure' this plant from the summit of St. Vincent's rocks, using a pocket-telescope to identify when it was in bloom and thus ready to be gathered.[36] The image of the heroic male plant-hunter, armed with scientific instruments, to 'peep at Madam Flora,' is evoked by Henry, while Ellen works in the domestic space of the

library with the flowers collected on a walk the previous evening.[37] In order to inspire Henry's botanical pursuits, his father will compose letters that feature Linnaeus's exploits: 'he was so interesting and uncommon a character, that I do not despair of communicating to you a portion of his enthusiasm, and throwing a charm around the study, by the detail of his adventures and difficulties, and the final success of his persevering exertions.'[38] Because Henry will shortly be departing for medical school at Edinburgh, his father also arranges for his son, while still at home, to be instructed in botany by his sister Ellen.

In the father's charging of Ellen to provide her brother with an informal education in botany, we see the pattern of a female family member — the mother in Fitton's *Conversations* and Aunt Lucy in Twamley's work — bearing responsibility for this facet of the family's learning. Henry's father expresses regret that his 'professional avocations have left [him] little leisure for the pursuit of many branches of knowledge,' including that of botany.[39] Henry is urged by his father to correct his misapprehension that botany 'is not a subject suited to what you consider the stronger powers of your sex.' That Henry's botanical studies are preparatory to his becoming a physician, while his older sister Ellen remains at home studying plants for 'pleasure' — presumably without any 'professional avocations' to devour her time — mutes any critique of the feminizing of botany.[40] Ellen's naiveté that Henry had to speculate at the time the alpine flower was in bloom and that her brother must instruct her in the existence and function of a pocket-telescope seem to differentiate further 'feminine' from 'masculine' botany.[41] Lest we dismiss *A Sketch* as an uncomplicated attempt to reclaim scientific botany for the male sphere, it is worth considering that its author was Sarah Waring (circa 1820). Here is a writer clearly adept at making her work appeal at once to young male readers and to the women who might instruct them in botany at home (and who might, themselves, aspire to the heroic exploits of Linnaeus).

Where, in *A Sketch of the Life of Linnaeus*, it is Ellen's younger brother who shows her the use of a pocket telescope for botanical inquiries, in Fitton's *Conversations* and in Twamley's *Our Wild Flowers*, it is the older women who demonstrate to their charges the importance of instruments in botanical inquiries. Explaining to Edward the structure and function of a Wall-flower's nectary, his mother provides him with a magnifying

glass, needle, and pen-knife — 'for some flowers are too delicate to be divided by the fingers alone.'[42] Aunt Lucy, likewise, in a lesson about composite flowers, gives Agnes her magnifying glass to see how the daisy is made up of a 'multitude of small florets assembled together.'[43] To assist Edward (and readers) in learning all twenty-four of Linnaeus's classes, Fitton's *Conversations* includes a set of illustrated tables by James Sowerby (1757-1822). These tables show the blossoms of plants isolated against a white background in small squares. In some cases, magnified views of the florets, pistils, and stamens are provided. The tables present specimen views of plants for quick reference. Recalling that the subtitle of Twamley's *Our Wild Flowers* is 'Familiarly, Described and Illustrated,' this orientation towards making plants recognizable is clear in Twamley's plates. In contrast to the specimen views of Sowerby's tables, Twamley's plates, which are engraved after her own drawings, depict species grouped together in floral arrangements. As she puts it in her preface, 'I have not written for the learned naturalist and the stern critic; I have written for the young, the enquiring, and the kind. I have wreathed England's Wild-flowers for England's Children.'[44] It is probably true that Twamley's coloured plates would have appealed to young readers, intimidated perhaps by the segmented views of Sowerby's tables.

It behooves us to be cautious, though, in accepting Twamley's assertions that she has learned 'very few of the "hard names" by heart; and it is very seldom that I pull a flower to bits, to discover its class and order.'[45] Like Parr Traill and other nineteenth-century women writers on botany, Twamley relies on the modesty trope — perhaps to forestall critiques of her botanical expertise or to secure an audience for her 'familiar' botany. Only an accomplished botanical artist could have produced the drawings from which Twamley's plates were engraved. Her modesty is translated into Twamley's characters of Aunt Lucy and Mrs. Evelyn. In one scene, Agnes and the older women pore over a specimen of butcher's broom. 'Let me take off a few of the lower leaves,' says Mrs. Evelyn, 'and now, with Aunt Lucy's microscope, you will soon understand the mystery.' Describing some of the specimen's features, Mrs. Evelyn continues, 'were we skillful dissectors, [we] would trace [the footstalk] down to the main stem.' In fact, Mrs. Evelyn seems to have done just that kind of detailed microscopic work because she reveals that within the flower, which is about the size of a pin's head, there are three petals and three

calyx leaves.[46] For Agnes, Aunt Lucy envisions a modest, unambitious life: 'it is very probable that her talents may not be such as to make her shine in the world of science as a learned botanist, or a profound astronomer; she may not even prove what is termed a clever woman, but this does not concern me now; all I aim at, in creating and fostering such tastes, is her own innocent and rational delight, both now and in after-life.'[47] A gap emerges, then, between Twamley's disavowal of the 'hard names' of plants and the Latin nomenclature that appears throughout *Our Wild Flowers*; little Agnes is being instructed in more than the familiar names of plants. Twamley adapts the portrait of Linnaeus as the adventurous plant-hunter to Aunt Lucy and Agnes; they are the 'heroines' of 'field-flower conversations.'[48] Aunt Lucy transmits to Agnes the observations of herbalists and of modern authorities, such as Linnaeus, Sowerby, and Smith, on plants. Where relevant to a particular species, details of ancient history and architectural ruins, and of classical mythology and folk-tales are threaded through the narrative. Agnes learns practical botanizing skills as well, such as how to take a specimen from a tree with a knife and not get scratched.[49] She should come armed with her own magnifying glass to botanize: 'a very cheap and simple one is a precious pocket companion to a young naturalist.'[50] This 'girl's own story' outruns, at times, the limits that Aunt Lucy would prescribe for her niece.

Published in 1839, Twamley's *Our Wild Flowers* registers some measured and some vociferous critiques of natural history practices. As we have seen in the case of the various nineteenth-century editions of Withering's *Arrangement of British Plants*, the compilation of an extensive herbarium was urged as an essential part of botanical inquiry. Because of its complexity, the class of cryptogams was to be avoided at the beginning of one's botanical studies. Twamley counters such advice by advising that 'a small collection of Mosses might be more easily formed, in point of preparation, than one of flowers, from their small size, and they also dry quickly.' Specimens may be dried in paper 'under pressure' or 'in an *old* book.' Later, the specimens may 'be stitched or gummed on sheets of white paper,' with their names, location, and date of gathering noted on the leaves of paper. Twamley, who temporarily assumes the role of teacher in this particular chapter, explains that 'when the preservation of flowers is attempted by beginners, there is such a slovenly waste of paper, and

such "litters" and "flutters" on tables and floors, that in many cases the displeasure aroused by untidyness is such as to nip the enthusiasm of the embryo botanist in the bud, and cause the habit of collecting to be abandoned in shame and disappointment.'[51] If the disarray caused by unsuccessful attempts at drying plant specimens is Twamley's central concern (and that the spirits of the young botanist remain high), her recognition that herbaria necessitate the consumption of much (wasted) paper is worth noting. The passage above carries the implication that not only will sheets of paper be squandered in these ill-advised first efforts at an herbarium, but also the plant specimens, themselves.

Elsewhere in Twamley's narrative, the collecting practices of conchologists or 'shelly people' are subject to critique. When Agnes and the other girls return with a specimen of the water violet (featherfoil) from one their botanizing rambles, they are amazed to discover tiny shells nestled in the plant's foliage. Mrs. Evelyn chides the girls for not recognizing that she possesses some of these specimens in her own shell cabinet. She corrects their assumption that all the shells in her cabinet are exotic: 'there is scarcely a ditch of tolerable size and tranquillity, where the poor creatures may not be seen on a warm sunny day, gliding about in the water, or crawling slowly on the plants near it. Some are scarcely larger than a pin's head, even at full growth, and others, such as the *Lymnaea stagnalis*, a beautifully formed and fragile shell, are above an inch long; while the largest bivalve...is six or eight inches broad.'[52] While one might expect Mrs. Evelyn to try to convert the girls to conchology, she expresses misgivings about the collecting practices of this branch of natural history: 'Your Aunt Lucy and I have often gone together to the banks of an old canal, armed with a tin box and some pierced tin spoons, made for the purpose, to capture specimens for our cabinets; but it always seemed to me a sort of scientific cruelty, which I could ill reconcile to my conscience.'[53] With so many Victorian natural history publications detailing how to capture and to stuff animals and birds, and how to prepare insects for microscopic examinations and to mount them on boards, Aunt Lucy's reference, however brief, to 'scientific cruelty' is revealing.

It is when Twamley comes to Agnes's education in orchids that the author expresses her ecological perspective most forcefully. Like many Victorians, Twamley is struck by the strange resemblances of various orchids to certain other creatures: 'their most extraordinary and grotesque forms,

singular habits and strange colours, make them seem like the very whims of Nature; as if she had been in a fanciful mood, and had tried to model reptiles and insects in the guise of flowers.' While the butterfly and spider orchises elicit comment, Twamley is enraptured by the lady's slipper, 'called by botanists *Cypripédium*, from two Greek words meaning *Venus*, and a *slipper*, a part of the flower being much like a delicate little shoe, and to whom could it more appropriately belong, than to Venus, the goddess of beauty, whose foot, of course, should be as pretty as the rest of her peerless form.' In the following passage, Twamley observes the sad fate to which this remarkable species has been consigned: 'It is rare, and the greedy selfishness of collecting botanists threatens to exterminate this and many other scarce plants; for when these grasping gentry find a floral treasure, they generally uproot and carry off all they can lay hands upon, forgetful or reckless of the wants and interests of their fellow-naturalists.'[54] While Aunt Lucy has a vasculum, presumably for the modest accumulation of specimens, Twamley is critical of the unrestrained 'collecting botanist.' A journalist from Birmingham who published articles in support of the working class Chartist movement, Twamley draws a class distinction between herself and the 'grasping gentry' whose acquisitiveness cares nothing for the preservation of native plants.[55]

It would not be until later in the nineteenth century that the full consequences of orchidmania would be acknowledged. Twamley's focus, here, on the threats faced by the English lady slipper were prescient. By 1917, the lady's slipper orchid was declared extinct in Britain. When, in 1930, a single plant was identified in the Yorkshire Dales, it was put under twenty-four hour guard while it bloomed. Spearheaded by the Cypripedium Committee, the 1990s saw a reintroduction programme by the Royal Botanic Gardens at Kew using seeds from the last remaining plant. Through this initiative, one hundred plants have been sown in the wild.[56] As we will recall, in *Canadian Wild Flowers*, the 'showy orchis' prompts Parr Traill to imagine the 'curious, flower-loving botanist [plunging] amid the rank, tangled vegetation, and [bringing] beauties to light.' Later in Parr Traill's work, the fearless plant-hunter and other settlers are understood to pose threats to such 'rare productions.' Writing three decades earlier and on the other side of the Atlantic, Twamley advances a similar critique centred on Britain's fragile lady's slipper.

Almost five decades after Twamley's and other fictional botanical

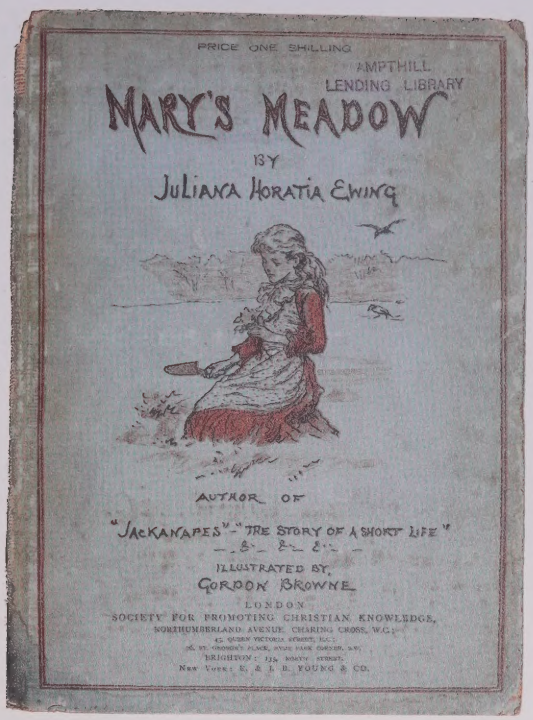


Fig. 44.
Cover, *Mary's Meadow*, Julia Horatia Ewing, 1886. Ruari McLean Collection. With kind permission of Robertson Davies Library, Massey College in the University of Toronto.

conversations appeared, a girl's own story by the botanist Juliana Horatia Ewing (1841-1885) entitled 'Mary's Meadow' (1884) adapted the family narrative format to somewhat different ends.[57] Serialized first in 1883-84 in *Aunt Judy's Magazine for Children* and, later, published in a one-shilling edition by the Society for Promoting Christian Knowledge (Fig. 44), Ewing's tale centres on the 'Game of the Earthly Paradise.' Schooled in the gardening works of John Parkinson (1567-1650) and Philip Miller (1691-1771), Mary and her siblings delight in planting their own gardens and in ornamenting wild and barren places. With cuttings and seeds, the titular character (whose poetic and floral alias is 'Traveller's Joy') transforms the menacing Old Squire's plot of land into a horticultural marvel: 'Not to be a garden,' Mary's meadow is 'one of the most flowery places I know.' With its wild roses, white bramble, hawthorn, dogwood, ferns, stinking iris, bent lilies, sweet white and blue dog violets, and 'two or three kinds of orchis, and all over the field cowslips, cowslips, cowslips,' Mary's meadow captured the late Victorian imagination.[58] In Ewing's sister's preface to the SPCK edition of 'Mary's Meadow,' she explains that the popularity of the story led to the founding of the 'Parkinson Society' in 1884. The Parkinson Society for the Love of Hardy Flowers had the fol-

lowing aims: 'to search out and cultivate old garden flowers which have become scarce; to exchange seeds and plants; to plant waste places with hardy flowers; to circulate books on gardening amongst the Members...[and] to try to prevent the extermination of rare wild flowers, as well as of garden treasures.'[59] While Ewing was alive, *Aunt Judy's Magazine* published the Society's reports and correspondence about botanical exchanges; after Ewing's death, the group forged ties with Kew Gardens. A legacy of the Parkinson group is Britain's Hardy Plant Society. Founded in 1957, the HPS has many local groups and maintains an active seed distribution scheme. While Twamley may have quietly registered, in her fictional botanical conversations, the threats over-collecting posed to British wild flowers, it was Ewing's serialized 'Mary's Meadow' that gave rise to a conservation effort to protect such species.

Botany at Craufurdland

At one point in Ewing's tale, we learn that Mary tried once to make a list of all the species growing in her meadow, 'but it was in one of Arthur's old exercise books, which he had "thrown in," in a bargain we had, and there were very few blank pages left.' Believing that she would only need only a couple of pages of her brother's exercise book, she 'began with rather full accounts of the flowers, but I used up the book long before I had written out one-half of what blossoms in Mary's Meadow.'[60] Emphasizing the variety of the plants in the meadow, this passage from Ewing also brings into view the Victorian practice of young women assembling their own botany books. That Mary must record her botanical observations in the leaves of her brother's old exercise book points to the scarcity of paper and to the practice of exploiting all the available space in such items from the stationer.

A simple, elegant botany book compiled by Janet Winifred Houison Craufurd (?-1836), a member of a famous Scottish family descended from Alfred the Great, underlines the place of botany in the education of young women at the upper end of the social scale during the nineteenth century. Even in elite households such as the Craufurds, paper was deemed so valuable that notebooks were repurposed. Janet Craufurd's botany book is a recycled French grammar notebook with brown marbled paper covers in a shell pattern. The inside cover of the book is

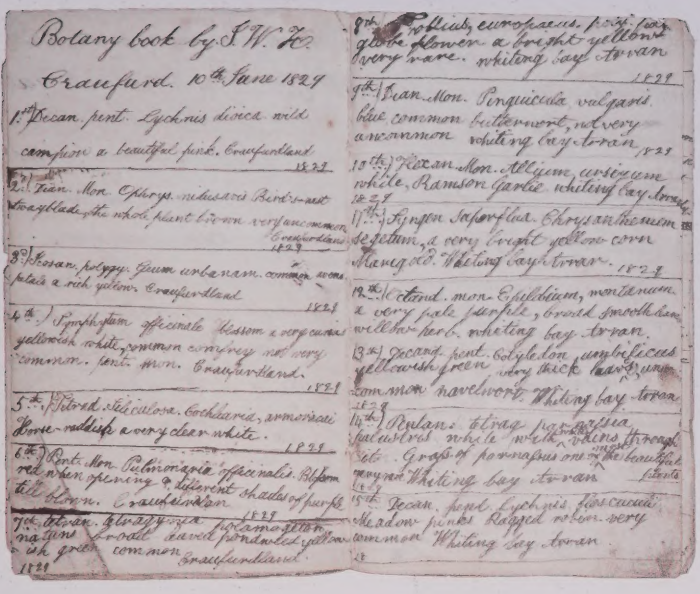

Botany book by J.W. H. C.
Craufurd. 10th June 1829
1st Decan. pent. Lychnis dioica. wild
campion a beautiful pink. Craufurdland
1829
2d Tetan. Mon. Ophrys. nidus avis Bird's-nest
Orchis. Craufurdland
3d Icosan. polygy. Papaver urbanum. common wood
poppy a rich yellow. Craufurdland
1829
4th Symphytum. officinale blossom a very curious
yellowish white, common enough not very
common. tenta. mon. Craufurdland.
1829
5th Pelord. siliculosa. Cochlearia, armoracia
Horse-radish a very clean white.
1829
6th Pent. Mon. Pulmonaria officinalis. Bl[oss]om
red when opening & different shades of purple
till blown. Craufurdland
1829
7th Tetran. Monogynia. Plantago lanceolata
narrow leaved ribwort plantain. yellow
ish green common Craufurdland
1829
8th Polian. europaeus. petals four
globe flower a bright yellow
very rare. whiting bay Arran
1829
9th Tetan. Mon. Pinguicula vulgaris.
blue common butterwort, not very
uncommon whiting bay Arran. 1829
10th Hexan. Mon. Allium ursinum
white, Ramson Garlic whiting bay Arran
1829
11th Syngen. Superflua. Chrysanthemum
segetum, a very bright yellow corn
Marygold. Whiting bay Arran. 1829
12th Octand. mon. Epilobium, montanum.
a very pale purple, crowd smooth leaved
willow herb. whiting bay Arran.
13th Decang. pent. Cotyledon umbilicus
yellowish green very thick leaved. com
common navelwort. Whiting bay Arran
1829
14th Rutan. Octag. Parnassia
palustris white with yellow streaks
etc. Grass of parnassus one of the beautiful
ornaments Whiting bay Arran
15th Decan. pent. Lychnis flos cuculi
Meadow pinks Ragged robin very
common Whiting bay Arran

Fig. 45.
Manuscript botany book of Janet Craufurd, 1829.

inscribed with the following: 'Janet Winifred H. Craufurd's Botany Book. Craufurdlande 10th June 1829.' The stubs of the first leaves of her grammar book are visible and show her conjugation of verbs. Like the acquisition of French, botany represented a suitable and desirable attainment for young women of elevated social status. Since the 1300s, the Craufurds have occupied Craufurdland Castle in Kilmarnock, in East Ayrshire, Scotland. Janet Craufurd's botany book lists thirty-six species observed between 1829 and 1830 at Craufurdland and at Whiting Bay, on the Isle of Arran in North Ayrshire. Adhering to Withering's Linnaean system of classification, Craufurd gives both the Latin and common names of species. The location and date she observed the species are also recorded (Fig. 45).

Though brief, the descriptions that Craufurd supplies for each species are evocative. The wild campion at Craufurdland in 1829 is a 'beautiful pink.'[61] The spatling poppy that she saw at Whiting Bay in July 1829 had a 'cup like a globe with purplish veins, blossom white leaves fleshy.' Of the lungwort that she encountered on her family's estate in 1829, she writes, 'blossom red when opening & different shades of purple till blown.' Such observations make clear that she returned to the same spots to observe the flowering of species. Her account of the common daisy at Craufurdland in March 1830 is botanically precise: 'florets yellow, outer petals

white, pink underneath leaves fleshy nicked.' Of the common primrose that she meets in the spring of 1830, she notes, 'blossom pale yellow flat, petals heart shaped leaves oblong wrinkled.' Relying on correct botanical terminology, she writes the following about the lousewort that she comes upon in the summer of 1830: 'Blossom purplish red calyx green within purple without.' The common wood avens that she finds at Craufurdland during the same summer has 'pistils like a brush.'

Craufurd's botany book preserves not only visual details and the time of flowering of plant species in Scotland but also observations about their distribution. She notes that the bird's nest orchid, whose 'whole plant [is] brown,' is 'very uncommon' in Craufurdland in 1829. In her area, the common comfrey is 'not very common.' The globe ranunculus is 'very rare' at Whiting Bay in 1829; the sea milk wort there is also 'rather rare.' A variety of other species are designated by Craufurd as 'common.' Of course, we must be cautious about over-determining the meaning of 'rare' as it appears in nineteenth-century documents; the word denoted all 'of a kind seldom found, done, or occurring; unusual, uncommon, exceptional.'[62]

If Craufurd's botany book does not explicitly chart species at risk, and simply documents that some species were rarely to be met with in certain locations at certain points in time, in light of the decline in biodiversity that we are witnessing today, her observations accrue value. To take just one example, the bird's nest orchid, so named because its tangled roots resemble a bird's nest, depends for its survival on a particular species of fungus. Craufurd's note that the entire orchid is brown is apt as this species has neither leaves nor chlorophyll. Drawing its nutrients from the fungus and not engaged in photosynthesis, the species grows in the shady forest floor. Like so many orchids, it is the plant's ephemerality that makes it so curious. It attains maturity only after ten years, at which time it 'blooms once, then dies.'[63] In its symbiotic relationship with a fungus, the bird's nest orchid is particularly resonant of the delicate ecological relationships that render some species so vulnerable. According to the International Union for the Conservation of Nature's 'Red List' for Plants, the most recent risk assessment for the bird's nest orchid was completed in 2011 and showed the population decreasing and severely fragmented with the number of mature plants declining. The threats identified by the IUCN to this particular species and its habitat are many:

residential and commercial use of land; tourism and recreation; agricultural use of land, and wood and pulp industries; and gathering of plants and human disturbance.[64] What Craufurd's botany book registers is that even by 1829, the bird's nest orchid was 'very uncommon' in this area of Scotland. As young, nineteenth-century women were encouraged to pursue botany as a form of polite accomplishment, encounters with rare species and the acquisition of their specimens were desirable. One cannot help but surmise that the alignment of Victorian botany with taste, and the sending of young women into the fields to observe and to draw British wild flowers had the unintended consequence of making some species even more rare.

Curious Orchids and other British Wild Flowers

It is worth noting that the current threats identified by the IUCN to the bird's nest orchid, specifically, plant gathering and human disturbance, are not at all new. In *Our Wild Flowers* (1839), the delight that Twamley takes in the strange forms of British orchids is mitigated by her concern that rapacious 'collecting botanists' will deplete the stock of such delicate native species. While Twamley is focused on the most reckless of botanizers, it behooves us to remember that she is writing during a period of railway expansion.[65] Inexpensive and efficient railway travel put once remote areas of England within reach and increased participation in botany. As David Allen has pointed out, while an expanded railway system enabled botanical societies to conduct expeditions in what were once distant or inaccessible locations, and thus to gather critical knowledge about species, even by the late 1830s, warnings were sounded that railways would ultimately figure in the decimation of some plant species.[66] Twamley's fears in 1839 for native orchid populations were hardly misplaced, then, as rail lines snaked into fragile habitats and the market was flooded with field guides and other printed matter that told readers which plants to collect and where. Anne Secord has urged us to attend to the novelty of coloured plates in nineteenth-century books and to the ways which such illustrations were implicated in debates about who should study botany and for what purpose. As she argues, such pleasing images might refine one's observational skills.[67] More generally, striking coloured plates also worked to make native plants objects of

desire at a key historical moment when groups of individuals gained both the means to reach once distant areas of the English countryside and the leisure time to do so.

An illustrated work of botany published by Jane Loudon (1807-1858) during this period, *British Wild Flowers* (1846), helps us to understand the ways in which Victorian print culture made novelties of native plants.[68] Her account of English orchids, in particular, reveals the imaginative pull of this family and how coloured plates fostered the appetite for orchids. Like Margaret Roscoe, who married into a botanical family, Loudon (née Webb) was the wife of the horticultural writer John Claudius Loudon (1783-1843). A professional author before her marriage, it was after she met John Loudon that she brought out a series of botanical works for a female readership. These works included *Botany for Ladies* (1842) and the multi-volume *The Ladies' Flower-Garden* (1840-48). Loudon's *British Wild Flowers* was published when she once again had to support herself by her own writing. By the 1840s, the fictional dialogue or conversation format of botany books, which had so dominated the first decades of the nineteenth century, was falling out of fashion.[69] Recognizing this trend, Loudon chooses to publish her *British Wild Flowers* as an illustrated non-fictional work to 'enable any amateur who may find a pretty flower growing wild to ascertain its name and some particulars respecting it.'[70] Pressing the case for the importance of her book, even as she downplays her expertise, Loudon writes, 'I have ventured to add a few remarks on the botanical construction of most of the plants, in the hope of inducing such of my readers as may be unacquainted with botany to study a charming science, which has hitherto been too much neglected.' Staking out a prominent role for botany in the formal education of women, Loudon asserts that 'nothing would give me more pleasure than to see botany commonly taught in girls' schools, as French and music are at present.' She also broaches the thorny subject of the suitability of Linnaeus's sexual system of classification for women readers: 'though the Linnaean system was unfit for females, there is nothing objectionable in the Natural Arrangement; and the prejudice against botanical names is every day declining, from the number of beautiful plants exhibited at Flower Shows which have no English appellations.'[71] If Latin names have now become necessary for identifying plants, in *British Wild Flowers*, Loudon placates both the proponents of Linnaean taxonomy and those of 'natural'

systems. She arranges her entries for plants according to the natural system of John Lindley (1799-1865) but provides the relevant Linnaean classes and orders as well. All true students of botany, Loudon advises, should also 'pay as frequent visits to a Botanic Garden as possible, in order to become familiar with the general appearance of the plants.'[72]

In their technical descriptions, Loudon's entries seem geared to readers with at least some knowledge of the science of botany. Her accounts of plants also move into the territory of the herbal as she gives the medicinal uses of some species. How classical myths and folk-tales figure in the etymology of the plant's names is chronicled with requisite poetic extracts supplied. Like Parr Traill, Loudon evokes the sentimental Victorian language of flowers to indicate, for example, that the common milkwort symbolizes solitude. The sweet violet inspires a particularly lengthy account of its symbolic and poetic meanings.[73] Sometimes a detail from Britain's own past provides context for a species and its providential function: the London Rocket 'sprang up in such abundance in London after the great fire of 1666, as to cover the ruins.'[74]

While her entries transport readers back in time and into the literary realm, Loudon delineates in precise terms the growing environments of each species.[75] Not unlike the narrative of Gilbert White's *Natural History of Selborne*, Loudon's readers can retrace her steps as she encounters the wild carnation growing on the walls of Rochester Castle, the Deptford pink in the 'gravelly' soil on the borders of woods and thickets, and the bladder-campion in chalky soils of the corn-fields and by the roadside.[76] Hedge-banks are the 'favourite situation' of St. Peter's wort, and dry woods and heaths are home to the 'elegant' upright St. John's wort.[77] Roscoe takes her would-be botanizing reader to sea cliffs to find tree-mallow and to the 'muddy, salt marshes' of England's Eastern coast to meet with the common sea-heath.[78] The sixty colour lithographed plates in *British Wild Flowers* allow readers to visualize what they will find on the heaths and in the marshes, on the walls of ruined castles and on the sea cliffs. We see in the plates that Humphreys designed for Loudon's *British Wild Flowers* his characteristic scientific accuracy and subtle use of colour. Eschewing the kind of seasonal arrangement we find in Roscoe's *Floral Illustrations* and in Parr Traill's *Canadian Wild Flowers*, Loudon's work gathers together related species in one plate. In a plate that features specimens of traveller's joy, meadow rue, and pheasant's eye (plate 1), the

Fig. 46.
Poppies, Jane Loudon, *British Wild Flowers*, 1846.

intricate construction or 'graceful lightness,' to use Loudon's language, of each of the small plants is shown.[79] Other plates, such as the one Humphreys designs for water lilies (plate 5), require more brilliant and bold swathes of colour. Mindful that Loudon's book was a reference book, in order to allow readers to recognize the white water-lily in the wild, Humphreys's hand-coloured lithograph shows its petals tinged with pink. Among the most brilliantly-coloured plates in Loudon is the one depicting poppies (plate 6) (Fig. 46). Humphreys' lithograph captures the deep red petals of the 'showy' corn-poppy and the 'blue or glaucous green' of the white poppy's leaves.[80] With the captions for its plates in script rather than letterpress, Loudon's book resembles an album; it could

almost be a private compilation like the anonymous Yorkshire gardens album.

From the outset, Loudon advises readers that she will describe 'only the most ornamental plants' in her volume of wild flowers; thus it is not surprising that she devotes much space to the orchis family.[81] Loudon is drawn to British orchids for the same reasons that Twamley and other Victorians were. The shapes of orchids seem to mimic 'bees, flies, lizards, monkeys, and even men.' Not only are their resemblances to other creatures curious, Loudon explains: 'their botanical details are equally remarkable; and the pollen is generally a waxy mass, which appears to have no connection with the stigma.'[82] Drawing attention to the separation of the male (pollen) and female (stigma) parts of the orchid, Loudon points to a question that would preoccupy Darwin. The ways in which the structure of orchids seemed designed to hinder self-fertilization was the subject of Darwin's *On the Various Contrivances by which British and Foreign Orchids are Fertilised by Insects, and on the Good Effects of Intercrossing* (1877). This work contained his explanation of how the structure of orchids encouraged cross-fertilization, and of how species of insects and orchids, through natural selection, co-evolved to better 'fit' one another. The case of an orchid from Madagascar with an almost twelve-inch long nectary and a moth from the same region with a similarly-sized proboscis that could drink from such a nectary illustrates vividly Darwin's theory.[83] Loudon, of course, is writing two decades before Darwin's book on orchids, which ultimately served to bolster his argument about evolution and natural selection in *On the Origin of Species* (1859). Her recognition that the botanical details of orchids are as curious as their fanciful shapes points to the prominent place this family of plants occupied in the minds of Victorian botanists, gardeners, and collectors.

Loudon's account of native orchids treats their strange resemblances to other creatures; she also maps their distribution and growing conditions in the wild. Some orchids mimic other botanical species; the coral-root orchid, found in the 'boggy woods' of Scotland, is aptly named for its branching root. The birds nest orchid that Craufurd took notice of in Scotland in the late 1820s is 'a leafless brown parasite, with succulent, long, clustered roots' found in beech woods or loamy soil.[84] For those orchids that imitate other animals, Loudon uses the epithet the 'frolics of nature' to describe species with such 'grotesque' forms.[85] In the monkey

orchis, for example, the curled segmented lip of the flower makes the 'arms' and 'legs' of the monkey and the calyx, the 'head.'[86] The green man-orchis appears 'just like a number of little men dressed in yellow with green caps on.'[87] In the case of all of the fly orchis, the bee orchis, and the spider orchis, the species 'appear as if an insect were hiding in the centre of the flower.'[88] The purple helleborine is one of the 'handsomest' orchids but also 'one of the rarest.' Its 'large and showy' flowers come out in May and June, and the plant 'is only found wild in Gloucestershire' and in the north of England 'where the soil is poor and stony.' The purple-leaved helleborine is also so rare that it has only been seen 'growing as a parasite on a stump of hazel or maple in some woods in Worcestershire, and in those of Woburn Abbey.'[89] The lizard orchis, 'formerly growing in great abundance in thickets in the chalky soils of Kent and Surrey, but it is now rarely to be met there.' The species' resemblance to a lizard — 'the head appearing buried in the calyx of the flower' — makes it 'exceedingly curious.'[90] Loudon concludes her treatment of orchids with the common lady's slipper: 'this beautiful plant, though rare in England, is yet a true native; and it is found in the mountainous woods and thickets in the north of England.' She adds that the lady's slipper is a perennial with a 'solitary' flower.[91]

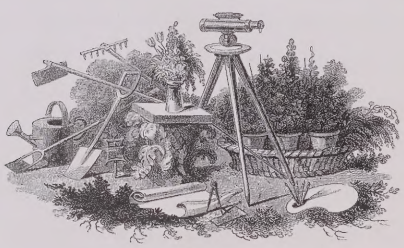
Humphreys' expertise in designing coloured borders with natural history motifs are evident in his hand-coloured lithographs of orchids for Loudon, not least because some of these 'mimic' species required him to combine images of flowers and insects (or other creatures) on one stalk. His rendering of the lizard orchis (plate 56) captures how as many as seventy flowers can grow from one spike and the how the head of the lizard appears buried in the calyx; the lizard's long 'tail' curls like a tendril. In the plate that features the bee orchis (plate 57) (Fig. 47), one could easily mistake the centre of the flowers for actual humming-bees settled on the plant. It would not be until the twentieth century that the reason why some orchids resembled female insects — to attract males to try to mate with them and thus initiating fertilization — would be explained.[92] Loudon's readers in the 1840s would only have noticed that orchids seemed stirring examples of *lusus naturae* (jokes of nature), such as butterflies whose wings were patterned after tortoiseshell. Slightly off-centre in this plate is the solitary flower of the lady's slipper — the yellow folds of Venus's slipper forming a 'delicate little shoe' for a 'peerless' goddess.[93]

Fig. 47.
Orchids, Jane Loudon, *British Wild Flowers*, 1846.

The pleasing coloured plates in Loudon exposed to light the rare native orchids nestled in the 'shady woods,' 'swampy meadows,' and thickets.[94] The Parkinson Society, we should remember, was not formed until 1884. Its goal of stopping the 'extermination of rare wild flowers' would have been even more pressing in the 1880s than it was during Loudon's day. The ways in which such illustrated works of botany as Loudon's *British Wild Flowers*, by heightening interest in native species, indirectly led to their decline is difficult to measure. A combination of factors - the expansion of the railway, the instituting of annual holidays, changing tastes in the plant-trade — all likely played a role. There can be little doubt, however, that field guides, drawing manuals, fictional botanical conversations, and illustrated works of botany all trained the attention of Victorian readers on the wild flowers of the English countryside.

With their elegant coloured plates, Roscoe's *Floral Illustrations* and Loudon's *British Wild Flowers* rank among the 'great flower books' of the Victorian period. To give one some idea of where these publications fell on the retail scale of illustrated works of botany, in 1831 a copy of Roscoe, with aquatint engravings, cost nine shillings. Two decades later, when Loudon's book with hand-coloured lithographs came on the market, a

copy bound in cloth retailed for two pounds and two shillings, while a copy half-bound in 'morocco' was priced at two pounds and ten shillings.[95] More affordable were the volumes in Lovell Reeve's Popular Natural History series. In 1855, the third edition of a work by Agnes Catlow (1807-1899), *Popular Field Botany*, which had twenty coloured plates, cost ten shillings and a sixpence.[96] Botanical periodicals furnished coloured plates at still cheaper rates. In 1831, a monthly number of Curtis's *Botanical Magazine* with coloured plates sold for 'three and six' or three shillings 'plain.' Slightly more expensive, at four shillings, was a monthly number of the new series of *Edwards's Botanical Register* with coloured plates.[97] During the mid-nineteenth century, the Society for Promoting Christian Knowledge and the Religious Tract Society (RTS) adopted new cheaper methods of colour printing such as 'Baxter prints.' In these illustrations, a monochrome image from an intaglio plate was combined with colour from wood or metal blocks. The SPCK's series by Anne Pratt (1806-1893), *Flowering Plants of Great Britain* and *Ferns of Great Britain*, made use of Baxter prints. In 1860, each of Pratt's volumes were priced at between twelve and fifteen shillings and contained about forty Baxter prints.[98] With a variety of techniques for printing coloured images at their disposal, which could be aimed at different tiers of the book market, Victorian publishers sustained the appetite for pleasing botanical plates.



Chapter Five: Orchids for the Few

Tracing the shifts in emphasis in great flower books during the period 1700-1900, Patrick Synge describes the ways in which the mid-nineteenth-century 'vogue' for 'warm greenhouse plants reached a greater pitch than ever before, and many treasures were brought back from South America as well as from the East Indies, fascinating Orchids and pitcher plants and weird Aroids.'[1] Synge's list encapsulates the Victorian taste for strange, exotic plants — carnivorous pitcher plants with deep cavities in which to trap their unsuspecting prey and thermogenic aroids (philodendrons) which attract their pollinators with sometimes sweet, sometimes foul odors. The lure of such plants rested also in the challenge they posed to British horticulturalists, who tried to replicate these species' native growing conditions in their gardens and glasshouses. Queen Victoria had her own Royal orchid grower in Frederick Sander (1847-1920), the German horticulturalist and later nursery-owner in St. Albans, Hertfordshire. Foreign orchids excited the curiosity of Victorians for several reasons. The ways in which native British orchids mimicked insects and other creatures, as we have seen, made them objects of intense interest. In foreign orchids, the range of such resemblances expanded dramatically. The whole of natural and artificial phenomena, from leopards to the characters of ancient languages, seemed to have analogues in exotic species of orchids. Many species of orchids were classified as epiphytes or 'air plants' because they grew anchored to other plants and trees. With their complex growing conditions and the fleeting nature of their blossoms, orchids tested the ingenuity of British gardeners. The desirability of foreign orchids was only increased by the epic tales of their seizure by fearless Victorian plant-hunters. Some rare items held by the Fisher Library connected to what became known as 'orchidmania,' the Victorian obsession with orchids, illuminate the role of women in botanical illustration. While it was the tales of fearless male orchid hunters braving the wilds of Central America for tropical orchids that dominated the headlines in Victorian Britain, in at least one major publication, it was women artists who translated these delicate specimens into visual culture.

Fig. 48.
Vignette, George Cruikshank, in James Bateman, *Orchidaceae*, 1837-43.

No Orchids for Atheists

If illustrated works by Loudon and others heightened interest in British native species of orchids, one landmark publication in Victorian flower books capitalized on the imaginative pull of foreign orchids: *The Orchidaceae of Mexico and Guatemala* (1837-43) by James Bateman (1811-1897). For its life-sized, exquisite hand-coloured lithographs of Central American orchids, Bateman's *Orchidaceae* might well garner the title of greatest Victorian flower book. Wilfred Blunt deems this work 'probably the finest, and certainly the largest, botanical book ever produced with lithographic plates.'[2] With only Audubon's *Birds of America* (1838) outstripping it in size, Bateman's *Orchidaceae* measures 73 cm x 53 cm, and weighs about thirty-eight pounds.[3] The vignette by George Cruikshank (1792-1878) near the beginning of Bateman's book showing a copy of the book being hoisted with ropes and pulleys by a group of men, presumably to shift it into a position to be read, is certainly apt (Fig. 48).[4] Its caption in Greek can be translated roughly as 'a big book is a big evil.'[5] Its bulk has earned *The Orchidaceae* the unaffectionate nickname of 'the librarian's nightmare.' Not by any standards a coffee-table book, a purpose-built

reading stand in the nineteenth-century may have been the only means by which to examine its pages. While works of botany often put in portable form the species found in nature, the scale of Bateman's book made orchids even less portable than when they were in bloom. When one remembers that orchid seeds are the very smallest of seeds — they are like dust — the weightiness of Bateman's publication assumes an added irony. Published by subscription in parts, Bateman's volume is among the rarest of Victorian flower books; the Fisher Library holds one of the 125 copies of *The Orchidaceae* ever published. In addition to members of the nobility, connoisseurs of rare plants and nurserymen, and the Royal Horticultural Society, two libraries in Manchester appear in Bateman's list of subscribers. Recognizing that most individuals could only dream of owning such an orchid book, Chetham's public library, founded in 1653, and the Portico Library, a subscription library established in 1806, must have raised the necessary twenty guineas to purchase Bateman's volume.[6] Thirty-seven of its forty lithographs were executed by Maxim Gauci (1774-1854) and were based on drawings by two women: Sarah Ann Drake (1803-1857) and Augusta Innes Withers (1792-1869). A botanical drawing instructor, Withers also served as 'Flower Painter in Ordinary to Queen Adelaide'; it was to this less familiar queen of the nineteenth century that Bateman dedicated his volume.[7] Drake provided drawings for such periodicals as the *Botanical Register*, as well as the illustrations for another sumptuous Victorian book of orchids, Lindley's *Sertum Orchidaceum* (1838). An album of Drake's original water-colour drawings is held by the Fisher Library and includes some of her preparatory drawings of orchids (Fig. 49). As one carefully turns the mammoth pages of Bateman's book, one is struck by the competing, gendered narratives that the author threads through *The Orchidaceae* of the brave men who hunt and capture the orchids in their native habitats and of the skilled women artists who preserve their ephemeral blooms on the page for all.

In the elaborate textual apparatus of *The Orchidaceae*, the garden designer and plant collector Bateman exploits the appetite for all things orchidaceous. According to Bateman, 1837 was the *'annus mirabilis'* for 'orchis-importatum'; three hundred new species were brought to England that year.[8] We find probably what is likely the first usage of 'orchidomania' in Bateman as he stokes his readers' imaginations with fresh instances of the ways in which orchids imitate not just nature but also

Fig. 49.
Drawing of *Stanhopea* orchid, Sarah Anne Drake, circa 1830.

art.[9] Assuming that his readers are familiar with the British orchids that resemble insects, Bateman moves swiftly to species in the tropics that mimic grasshoppers, mosquitoes, dragon-flies, and moths. The blossoms of the 'vegetable-butterfly' orchid of Trinidad 'wanton gaily in the wind.' In his use of 'wanton,' Bateman suggests that such 'hybrid' orchids display a lack of restraint. The shapes of swans, eagles, doves, and pelicans also find their doubles in various orchids, as do the particular appendages of birds — wings, feathers, beaks, and bills. Among the beasts that orchids imitate are tigers and frogs. Some orchids are patterned after shells, while others take armour and weapons as inspiration for their shapes. It is not only the flowers of orchids that possess this 'mimic' power. An almost breathless Bateman tells us that that the bulbs of species 'have been likened to onions, cucumbers, bamboos, and palms; tongues and mouse-tails; hooks, whips, and straps; swords and needles, &c. &c.' and that 'the leaves [of some] are inscribed with Arabic characters.'[10] The final vignette in Bateman's book, supplied by Katherine Charteris Grey (Lady Jane Grey of Groby) (1773-1843), who made a pressed-orchid album, dramatizes what Bateman calls the 'mimicking propensity' of orchids (Fig. 50).[11] Theresa Kelley describes this tail-piece as 'a tableau in which a near-riot

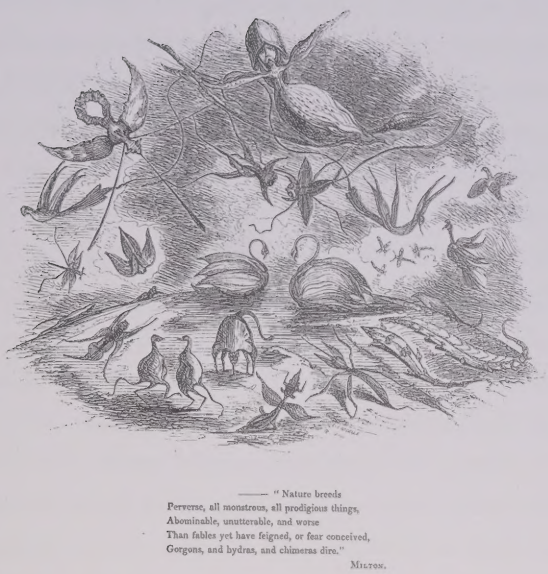

—— "Nature breeds
Perverse, all monstrous, all prodigious things,
Abominable, unutterable, and worse
Than fables yet have feigned, or fear conceived,
Gorgons, and hydras, and chimeras dire."
Milton.

Fig. 50.
Vignette of 'monstrous' orchids by Lady Jane Grey of Groby in James Bateman, *Orchidaceae*, 1837-43.

of orchids cavort, all looking like something else."[12] A passage from Milton's *Paradise Lost*, 'Nature breeds / Perverse, all monstrous, all prodigious things,' serves as a caption for the detached orchid blossoms mingling with over-sized insect-orchids and strange birds.

Like many botanical authors, Bateman attempts to reconcile his faith with what appeared to be examples of a Creator gone wild or a nature with a 'restless faculty of invention."[13] Acknowledging that the many of species of orchids do not seem to contribute meaningfully to the survival of human beings, Bateman posits that 'either...in the cheerless spirit of atheism, we must suppose [orchids] to have been created in vain, or we must conclude that their office was something other and higher than to minister to the mere animal necessities of our nature. No; it was to yield us a pleasure of an intellectual kind, and so to win our affections from more hurtful things, that these most worthless of plants were clothed in unrivalled charms.' Without a slip, Bateman moves from orchids as an innocent rational diversion to their curious material qualities, and to how this family of plants 'might attract the man of pleasure by its splendour, the virtuoso by its rarity, and the man of science by its novelty and extraordinary character."[14] Commercial speculation is portrayed almost

as missionary work in Bateman's approving portrait of orchid hunters: 'not contented with the exertions of our foreign connexions, we send men expressly to all the points of the compass, to swell the number of the species in cultivation; and in their zeal for their introduction, the amateur, the nurseryman, and the public establishment all vie with each other. The nobility, the clergy, those engaged in the learned professions or the pursuits of commerce, seem alike unable to resist the influence of the prevailing passion.' Sanctioning further this appetite for new orchids, Bateman cites a recent item in the *Morning Post* about the Chinese 'air-plant' recently blooming in the royal conservatory at Windsor Castle.[15] Even with this royal precedent, there is surely something ironic in Bateman's imperial vision of 'swelling' the British realm with air plants.

Although *The Orchidaceae* is meant to inflame, not temper, orchid fever, Bateman's project is very much an aristocratic one. He writes of orchid-houses having become requisite 'in all the designs for a complete residence' and even includes in his volume architectural drawings of the epiphyte-houses of two great English orchid collectors.[16] It is inevitable, Bateman states, because of the 'difficulties and expense,' that 'Orchidaceous culture will always continue in a (comparatively) few hands' and that it will 'be pursued with the same ardour in the upper walks of life, that already, in the humbler sphere, attends the cultivation of the many beautiful varieties of the tulip, auricula, and carnation.'[17] The commercial imperatives guiding Bateman's project are on display in his declaration that 'few will value what all may possess.'[18] In fact, in another decade or so, the gardener Benjamin Williams (1822-1890) would publish his series of articles, 'Orchids for a million,' in the *Gardeners' Chronicle* (1851). In these pieces, and in the popular volume in which they were collected, *The Orchid-Grower's Manual* (1852), Williams makes the counter-argument that cultivating orchids is relatively easy and affordable. Endersby has identified the abolition of the glass tax and the invention of Wardian cases as factors in the rising popularity of orchid-growing in Victorian Britain.[19] With just one illustration in its first edition — its coloured frontispiece showing the *Sophronitis grandiflora* — Williams' practical manual was the antithesis of Bateman's over-sized tome. In the preface to this first edition, Williams points his readers to even less expensive sources for information about orchids. In the *Penny Cyclopaedia*, he advises, there is an article on epiphytes.[20] The article to which Williams

refers appeared in the *Penny Cyclopaedia* in 1837, published by the Society for the Diffusion of Useful Knowledge (SDUK). In 1840, there had appeared articles in the *Penny Cyclopaedia* on Orchidaceae (the Linnaean class of *Gynandria Monondria*) and a shorter entry on the genus *Oncidium*.[21] The language upon which Bateman relies in his apology for orchidaceous knowledge remaining the preserve of the upper classes is telling: 'nothing ought to be condemned or disregarded, merely because it can never be extensively diffused.'[22] When Bateman wrote these lines in around 1843, the SDUK had already run its series on orchids. His passage about orchids being appropriate for the 'upper walks of life' and carnations for the 'humbler sphere' betrays, perhaps, Bateman's anxiety about these curious plants migrating into the hands of the 'millions.' Certainly, he had no direct competitors for an orchid book on his scale. Even so, Bateman does mention in his introduction that 'works solely devoted to the "Orchidaceae" have made, or are about to make, their appearance.'[23] Perhaps he wondered if the market for orchid books (and for orchids) would soon peak. Not unlike the nineteenth-century debates about who should study botany and why, for economic and class reasons, the cultivation of orchids was contested during the Victorian period. In order to realize the greatest profit possible for exotic species of orchids, the rare plant had to reach the discriminating customer. Bateman's orchid book was a rare publication for the reader with rarified tastes. As authors such as Bateman tried to reclaim this family of plants for nobility and their drawing-rooms, Williams and the SDUK sought to demystify the cultivation and anatomy of orchids.

As befits a book tied to the speculative orchid market, the theme of risk suffuses *The Orchidaceae*. Although the subscription model mitigated somewhat the financial risk associated with such an ambitious publishing project, the very ephemeral nature of orchids made Bateman's volume an inherently risky venture. As he acknowledges, the publication was delayed 'in part, to the dilatory blooming of particular plants, without which the series of illustrations would have been incomplete.'[24] While Bateman's work relies in some instances on herbaria specimens, in the main it endeavours to portray orchids after their living state, for their 'succulent and fragile nature' makes it all but 'impossible' to dry specimens of some species. Even when specimens have been carefully preserved in herbaria, they are often 'imperfect and difficult of

determination.'[25] The risk attendant in promising life-sized illustrations of exotic orchids to subscribers is equalled only by the risk, it appears, inherent in commissioning shipments of foreign orchids. One of Cruikshank's vignettes shows two giant cockroaches escaping from a newly arrived box of orchids from the tropics while the estate-owner's servants valiantly chase the over-sized insects with a spade and pitchfork. Bateman's outrage matches that of the disappointed British orchid collector: 'It is indeed a cruel thing to expect Epiphytes and receive only Cockroaches!!'[26] If foreign orchids do, miraculously, arrive free from insect damage, inside one's orchid-house, the drama never ceases as 'the life-and-death struggles of a recent importation have to be watched over, and that too with a degree of care and anxiety that could never be felt for ordinary plants.'[27]

Orchid Hunters and Orchid Painters

Most at risk in orchidaceous enterprises, Bateman tells readers, is the male plant-hunter who selflessly endangers his life in the quest to procure exotic plants on behalf of the British realm. *The Orchidaceae* is filled with portraits of these heroic orchid collectors, who scamper up mountain ledges and descend into dark ravines in Central America to capture the orchids that have eluded other plant-hunters. Extremes in temperature and swarms of fire ants are only some of the difficult conditions they brave. An account of the nurseryman Francis Henchman (fl. 1830) collecting the orchid from Xalapa, Mexico, which became known as the *Stanhopea Tigrinia*, encapsulates the heroic 'exertions' of plant-hunters who pry such orchids from their quiet refuges: *'S. tigrina* was found by Mr. Henchman at a considerable elevation above the level of the sea, and the only specimen which he observed in flower, was growing (at the distance of about five feet from the ground) in the cleft of an aged tree in a deep and dismal glen.'[28] In his entry for *Cattleya Skinneri* (Mr. Skinner's Cattleya), Bateman recounts how Guatemala may have 'continued a "*terra incognita*"' for orchid enthusiasts had not the Scottish botanist George Ure Skinner (1804-1867), who was also an estate-owner and merchant in Guatemala, agreed to act as Bateman's agent. Skinner threw himself enthusiastically into his commission: 'From the moment he received our letter, he has laboured almost incessantly to drag from their

hiding places the forest treasures of Guatemala, and transfer them to the stoves of his native land.' Apparently nothing could deter him from his mission: 'In sickness or in health, amid the calls of business or the perils of war, whether detained in quarantine on the shores of the Atlantic, or shipwrecked on the rocks of the Pacific, he has never suffered an opportunity to escape him of adding to the long array of his botanical discoveries.'[29] An acknowledgement for his tireless work introducting foreign orchids into Europe is Bateman's arranging for this species of cattleya to be named after Skinner. Evident in Bateman's use of the *terra incognita* trope to describe regions whose orchidaceous flora had not yet been catalogued by British botanists is the colonial frame of such plant expeditions. By describing the movement of Central American orchids to Britain as 'transfers,' Bateman implies an ownership of these plants when imperial theft would now be the more apt term. Certainly, it is without a hint of self-consciousness that Bateman refers to Skinner's 'ransacking the interior of Guatemala for plants.'[30] To delineate further the heroics of orchid hunting, Bateman includes in *The Orchidaceae* Skinner's own account of his 'discovery' of the *Epidendrum Stamfordianum* at Lake Isabal in Guatemala. 'While detained at Isabal by the cholera,' Skinner writes, 'I quietly took a canoe, and amused myself by a cruise of a few leagues along the shores of the great lake, in search of our favourite Ochidaceae.' He came upon a four-coloured orchid that was suspended over the lake. Skinner recounts how he initially hesitated to plunder this species, 'but I found it in such abundance, and in such splendid flower withal, that I at length nearly filled my canoe before I could stay my hand, fancying each specimen finer than the one before it.'[31] These lines embody the psychology of orchidmania in which the next new orchid promised to be even more exquisite than the last. That even 'abundant' species might become rare by overcollecting does not seem to occur to Skinner or, at least, such an awareness would be at odds with the profits he might realize with such a new introduction. If British plant-hunters in the mid nineteenth century must 'drag from their hiding-places' Central American orchids, it is worth noting that elsewhere in *The Orchidaceae*, Bateman feminizes some orchids as having a 'shy disposition' (not wishing to bloom on British soil). For its delicate pink blossoms, another species is named 'blushing epidendrum.'[32] Bateman's work brings home the ways in which the rhetoric of orchid-hunting in Central America is

entrenched in language of colonialism, conquest, and gendered violence.

Set against Bateman's narrative of male heroic orchid hunters are the women botanical artists who produced the startlingly beautiful illustrations that made his risky publishing venture a success. While the orchid hunters may have considered these species as fugitives always trying to elude their grasp, Drake, Withers, and the other women artists in *The Orchidaceae* were charged with capturing on the page the fugitive beauty of these plants. With blossoms shaped like a swan, which last only three days, the *Cynoches Ventricosum* posed a challenge to Bateman's desire to publish plates based on drawings of live plants. When a cynoches shipped by Skinner from Iztapa, Mexico to Bateman at Knypersley Hall at Staffordshire suddenly bloomed, Bateman had to act quickly: 'Fearing that the flowers of our new Cynoches might prove too fleeting to admit of their being sent to a professional artist in London, we were extremely perplexed as to what course to pursue, when this young lady was so kind as to relieve us from our embarrassment, by tendering the assistance of her admirable pencil, which she used on this occasion with even more than her wonted skill.'[33] In this case, the young lady with the 'admirable pencil' was a Miss Jane Edwards (fl. 1830). Recalling Elizabeth Perkins's critique of the quality of the coloured plates in botanical periodicals in the 1830s, and her desire to train young women in drawing plants directly from nature, Edwards possessed the skills necessary, acquired at drawing school or through artists' manuals, to depict the arching neck of the swan and its wings as they formed the delicate yellow blossoms of Bateman's orchid. Technically an 'amateur' artist, Edwards also supplied the drawing for Bateman's plate showing *Sobralia Decora*.[34]

Collaborations between women at a distance occurred to produce other plates in Bateman. While Withers is credited for the plate of *Laelia Majalis*, Bateman adds that Emma Talbot (1806-1881), the wife of the botanist John Dillwyn Llewelyn (1810-1882), provided a preparatory drawing from a live plant. John Llewelyn cultivated one of these orchids at Penllergare in Swansea, but 'however beautiful, [it] consisted of only a solitary flower.' Knowing that 'in a wild state three or four are borne upon a spike, in the manner represented in the plate,' Bateman had Withers create a composite figure. Emma Llewelyn made 'a most accurate drawing upon the spot (in July, 1840),' which, when combined with 'native specimens in Prof. Lindley's Herbarium,' allowed Withers to produce the

Fig. 51.
Plate of *Galeandra Baueri* by Sarah Ann Drake in James Bateman, *Orchidaceae*, 1837-43.

figure for this plate.[35] Because Emma Llewelyn supplied a colour rendering of the orchid's blooms, Withers did not need to rely on herbarium specimens for their colour — only for guidance as to how to multiply the flowers on the orchid's spike. Drake's illustration of the *Galeandra Baueri* is another example of a composite illustration from more than one specimen (Fig. 51). It was, Bateman explains, from a plant that flowered for the botanist George Barker (1776-1845) in 1839, 'assisted by native specimens more recently discovered by Mr. Skinner in Guatemala [that] Miss Drake prepared the exquisite drawing from whence the accompanying plate is taken.'[36] Among the virtuoso performances by Bateman's artists in *The Orchidaceae* is Withers' portrait of the *Maxillaria Skinneri*, in which

Fig. 52.
Plate of *Maxillaria Skinneri* by Augusta Withers in James Bateman, *Orchidaceae*, 1837-43.

the orchid's 'curious fleshy tongue-like process...lodged between the lobes,' and the base of the white column 'mottled with crimson dots...with a profusion of woolly hairs scattered on its under side' are rendered in astonishing detail (Fig. 52).[37] One wonders if, when Georgia O'Keeffe (1887-1986) composed her large-scale flower studies during the first half of the twentieth century, including a pastel drawing of an orchid in 1941, she had ever had the opportunity to examine a copy of Bateman's volume.

Over the course of the nineteenth century, beyond the publication of Bateman's *Orchidaceae*, the pace of orchid hunting only accelerated. When Williams put out the fourth edition of *The Orchid-Grower's*

Manual in 1871, he could report that 'the cultivation of Orchidaceous plants is no longer exclusively the privilege of the few.'[38] By the sixth edition (1885), he could add that some orchids could be purchased for a few shillings each.[39] His satisfaction at the democratization of orchid growing is tempered, however, by the over collecting by rapacious plant-hunters. Like Bateman, Williams pays homage to the men who 'laboured so arduously and incessantly to enable us to enjoy the beauties of the choicest productions of the vegetable world, without the dangers and difficulties with which they had to contend'; Williams even supplies a catalogue of their names for readers. For Williams, Skinner and his contemporaries in the first half of the nineteenth century represented more conscientious collecting. Later Victorian plant-hunters, observes Williams, 'seem determined to exterminate the race of Orchids from their natural localities.'[40] When we consider that, today, consumer demand for orchids is only increasing and that of the orchid species that have been assessed by the IUCN, over fifty percent have been categorized as threatened, perhaps the most sustainable way of encountering such delicate orchids is through the fully-digitized, open access copies of Bateman's volume made available through the Biodiversity Heritage Library and the Internet Archive.[41] As we shrink Bateman's pages to fit our computer screens, we are less able, perhaps, to appreciate the life-sized dimensions of Drake and Withers' illustrations. The ability, however, to magnify these hand-coloured lithographs — to see the individual 'woolly hairs' on the *Maxillaria Skinneri* and thereby to register the skills of the women artists who caught these 'fleeting' blooms on the page — more than compensates for any drawbacks. Bateman and *The Orchidaceae* may have been implicated in the decline of some species of orchids, but his great Victorian flower book preserves for us what are now vital visual records of these curious species.

Epilogue

O to blot out this garden
to forget, to find a new beauty
in some terrible
wind-tortured place.
-H. D., 'Sheltered Garden'

Knowing that I was curating this exhibition, a friend recently gave me some natural history volumes with special provenance; the books were owned by her grandmother, Dora Ridout Hood (1885-1974). Hood was the first antiquarian book dealer to specialize in Canadiana and she operated Dora Hood's Book Room out of her home on Spadina Avenue in Toronto.[1] In 1915, she acquired a copy of the *Field Book of American Wild Flowers* (1912) by Ferdinand Schuyler Mathews (1854-1938). An elegant vignette featuring a blue flag iris is blocked in gold on its green cloth cover. Hood annotated her copy of Mathews' field guide with notes of her own encounters with these plants. In Goderich in August 1922, she saw a fringed gentian; in Barnesdale in May 1950, she observed an example of Dutchman's breeches. Two sets of marginalia by Hood are found with Mathews' entries for the orchid family. Above a coloured plate of the showy lady's slipper, Hood has documented her sighting of the plant at Ontario's Holland Marsh. Below Mathews' account of the moccasin flower (the stemless lady's slipper), Hood notes that she transplanted one of these lady's slippers from the high grounds behind the C.N.I.B to a flower bed beside her cabin in 1962. The transplantation was successful: in the spring of 1963, twelve plants were in bloom. Hood's natural history interests were not confined to plants. On an endleaf of her copy of *Bird-Life* (1913) by Frank Chapman (1864-1945), she recorded her sightings of robins and blackbirds, mainly in the months of March and April, from 1921 to 1926. Hood also owned a copy of *Our Ferns in their Haunts* (1901) by Willard Nelson Clute (1869-1950). This field guide was published by William Briggs, who brought out the fourth edition of Chamberlin and Parr Traill's *Canadian Wild Flowers*. Like Parr Traill, Hood was taken with ferns and she carefully pressed her specimens between the pages of Clute's guide; intact specimens of maidenhair and hart's tongue fern

remain in her copy. A draft of a letter that Hood sent to the Department of Botany at the University of Toronto in July 1970, four years before her death, and the response she received are also tucked into her copy of Clute. She had sought assistance in identifying what turned out to be a specimen of cinnamon fern from her fern bed in Muskoka. Hood was born not long after Parr Traill had concluded her lifetime of botanical research and natural history writing. By the time that Hood began recording her observations of birds and of Canadian wild flowers and ferns, affordable, illustrated guides to local flora were available. What this exhibition has sought to trace is the process by which natural history pursuits were encouraged and made popular through the medium of print during the Victorian period. As Hood's copies of Mathews, Chapman, and Clute show, readers continued, late into the twentieth century, to make their copies of natural history handbooks the receptacles for their specimens and the knowledge they acquired in the field. In our efforts today to leave no trace of our encounters with nature, photographs or, in rarer cases, sketches, have replaced the physical specimens that we so often find preserved among the leaves of guide books belonging to collectors and enthusiasts of another generation. The collection practices of the nineteenth century were not sustainable and, in some instances, contributed to the endangerment of individual species. Still, the print and manuscript items which issued from this insatiable appetite to encounter and to possess all manner of wild flowers, birds, seaweeds, butterflies, ferns, and orchids have left us a valuable archive through which to study the discourses of both loss and preservation which define Victorian natural history.

For their comments and suggestions, the author wishes to thank the General Editors at the Fisher Library, as well as Suzanne Bailey, Karen Bourrier, David Fernández, Mark Laird, Mark Lyall, P.J. MacDougall, and Lindsay Wells. Special thanks to my colleague and friend Jenny McKenney.

Illustrative Notes.

List of Items in the Exhibition

Case One

Alexander Thomson. Hortus Conservatio, or Garden Preservation of Plants Indigenous and Exotic. England, 1823.

William Withering and William MacGillivray. *A Systematic Arrangement of British Plants*. London: Scott, Webster, and Geary, 1835.

William Mavor. *The Lady's and Gentleman's Botanical Pocket Book: Adapted to Withering's Arrangement of British Plants*. London: Vernor & Hood, [1800].

William Withering. *An Arrangement of British Plants: According to the Latest Improvements of the Linnaean System: With an Easy Introduction to the Study of Botany*. London: Cadell and Davies, 1818.

Agnes Chamberlin and Catharine Parr Traill. *Canadian Wild Flowers*. Toronto: William Briggs, 1895.

Agnes Chamberlin. Original Watercolour Paintings of Canadian Wild Flowers. Circa 1865.

Case Two

Charles Fothergill. *Ornithologia Britannica, or, A list of all the British Birds: in Latin and English*. York: W. Hick, 1799.

Philip Henry Gosse. *Popular British Ornithology: Containing a Familiar and Technical Description of the Birds of the British Isles*. London: Reeve, Benham, and Reeve, 1849.

[Mary Matilda Howard]. *Mary's Scrap Book, By a Lady*. London: Wm. S. Orr and Co., 1838.

The Book of Birds, (Class AVES). London: John W. Parker, 1837.

William Henry Hudson. *Lost British Birds*. [London], 1894.

Charles Fothergill. Canadian Researches chiefly in Natural History. 1816-1821.

Charles Fothergill. Interleaved copy of Thomas Bewick, *A History of British Birds*. Newcastle: Edward Walker, 1804.

Charles Fothergill. Drawings of Birds, Butterflies, etc. 1800-1812.

Thomas Bewick. *A History of British Birds.* Newcastle: C.H. Cook for R.E. Bewick, 1832.

Gilbert White. *The Natural History and Antiquities of Selborne.* London: Swan Sonnenschein, 1888.

Gilbert White. *The Natural History of Selborne.* London: C. and J. Rivington, 1825.

Case Three

Fred Enock. Album of Original Drawings. [England?], [189-?].

Alexander Montagu Browne. *Practical Taxidermy.* London: L. Upcott Gill, 1884.

Thomas Brown. *The Taxidermist's Manual; or, The Art of Collecting, Preparing and Preserving Objects of Natural History.* Glasgow: A. Fullarton, 1833.

John George Wood. *Common Objects of the Microscope.* London: G. Routledge, [1861?].

Louisa Lane Clarke. *Objects for the Microscope: Being a Popular Description of the Most Instructive and Beautiful Subjects for Exhibition.* London: Groombridge and Sons, 1870.

Mary Ward. *A World of Wonders Revealed by the Microscope: a Book for Young Students.* London: Groombridge and Sons, 1858.

John George Wood. *The Common Objects of the Country.* London: George Routledge and Co., [1866].

John George Wood. *The Common Objects of the Country.* London: George Routledge and Sons, [1866].

John George Wood. *The Common Objects of the Country.* London: George Routledge and Sons, [1890-1892].

Manuscript Album of Entomology by Miss Parker [circa 1820].

William Stephen Coleman. *Our Woodlands, Heaths, and Hedges.* London: Routledge, Warnes, & Routledge, 1859.

Thomas Moore. *British Ferns and their Allies.* London: Routledge, Warne, and Routledge, 1860.

Case Four

James Lee. *Coloured Specimens to Illustrate the Natural History of Butterflies*. London: W. Miller, 1806.

Balland, Eugène Amédée. *Les Papillons leur Histoire, la Manière de leur Faire la Chasse et de les Conserver*. Paris: Pierre Blanchard, [1823].

Maurice Sand. *Le Monde des Papillons: Promenade à travers Champs*. Paris: J. Rothschild, 1867.

George Brettingham Sowerby. *A Catalogue of the Shells contained in the Collection of the late Earl of Tankerville: Arranged according to the Lamarckian Conchological System*. London: E. J. Stirling, 1825.

William Turton. *A Manual of the Land and Fresh-Water Shells of the British Islands: Arranged according to the more Modern Systems of Classification; and Described from Perfect Specimens in the Author's Cabinet*. London: Longman, 1831.

William Stephen Coleman. *British Butterflies: Figures and Descriptions of Every Native Species*. London: Routledge, Warne, & Routledge, 1860.

Henry Keys Jordan. *A Complete Catalogue of British Mollusca*. Bristol: Mardon, Son, and Hall, 1870.

T. Cooke, Naturalist, Priced Catalogue. London: Napier, [circa 1880].

H. Noel Humphreys. *The Butterfly Vivarium; or, Insect Home*. London: William Lay, 1858.

George Brettingham Sowerby. *Popular British Conchology*. London: L. Reeve, 1854.

George Montagu. *Testacea Britannica*. Romsey: J.S. Hollis, 1803-1810.

Case Five

Humphry Repton. *Fragments on the Theory and Practice of Landscape Gardening*. London: T. Bensley and Son, 1816.

Catherine Mary Buckton. *Town and Window Gardening Including the Structures, Habits and Uses of Plants*. London: Longman, Green, & Co., 1879.

Nathaniel Bagshaw Ward. *On the Growth of Plants in Closely Glazed Cases*. London: J. Van Voorst, 1852.

Eleanor Anne Ormerod. Autographed letter addressed to Miss Nisbet. Torrington House, St. Albans: 7 February 1893.

John R. Mollison. *The New Practical Window Gardener*. London: Groombridge and Sons, 1879.

Shirley Hibberd. *Rustic Adornments for Homes of Taste, and Recreations for Town Folk, in the Study and Imitation of Nature*. London: Groombridge and Sons, 1856.

Cornelia Jefferson Randolph. *The Parlor Gardener: A Treatise on the House Culture of Ornamental Plants*. Boston: J.E. Tilton, 1861.

Philip Henry Gosse. *Wanderings through the Conservatories at Kew*. London: Society for Promoting Christian Knowledge, 1856.

Shirley Hibberd. *The Amateur's Greenhouse Conservatory*. London: Groombridge and Sons, 1875.

Shirley Hibberd. *New and Rare Beautiful-Leaved Plants*. London: Bell and Daldy, 1870.

Case Six

William Grosart Johnstone and Alexander Croall. *The Nature-Printed British Sea-Weeds*. London: Bradbury and Evans, 1859-60.

H. Noel Humphreys. *Ocean Gardens: The History of the Marine Aquarium*. London: Sampson Low, Son, and Co., 1857.

David Landsborough. *Treasures of the Deep; or, Specimens of Scottish Sea-Weeds*. Glasgow: D. Bryce, 1847.

Album of Algae Specimens. [England, circa 1867].

Louisa Lane Clarke. *The Common Seaweeds of the British Coast and the Channel Islands*. London: F. Warne, [1865].

John Ellor Taylor. *Half Hours at the Sea-Side; or, Recreations with Marine Objects*. London: D. Bogue, 1880.

Isabella Gifford. *The Marine Botanist; an Introduction to the Study of Algology*. London: Darnton, [1848].

Charles Alexander Johns. *Sea-Weeds*. London: Society for Promoting Christian Knowledge, 1860.

Shirley Hibberd. *The Book of the Fresh-Water Aquarium*. London: Groombridge, 1856.

Amelia Griffiths. Album of Seaweed Specimens. England, circa 1830-1840.

Case Seven

Flowers from our Yorkshire Gardens, 1880-1886. [Yorkshire, 1880-1886].

Janet Winifred Houison Craufurd. Botany Book. [Kilmarnock], 1829.

Elizabeth Steele Perkins. *Elements of Drawing and Flower Printing in Opaque and Transparent Water-Colours.* London: T. Hurst, 1834.

Juliana Horatia Ewing. *Mary's Meadow; and, Letters from a Little Garden*. London: Society for Promoting Christian Knowledge, 1886.

Louisa Anne Twamley. *Our Wild Flowers Familiarly Described and Illustrated*. London: C. Tilt, 1839.

Sarah Mary Fitton. *Conversations on Botany*. London: Longman, 1831.

Jane Loudon. *British Wild Flowers*. London: William Smith, 1846.

Margaret Roscoe. *Floral Illustrations of the Seasons*. London: R. Havell, Baldwin, and Cradock, 1831.

George Shaw. *Select Specimens of British Plants*. London: W. Bulmer and Co., 1809.

Charlotte Strickland and Juliana Sabina Strickland. Specimens of British Plants. [England, 1790-1803?].

Case Eight

James Bateman. *The Orchidaceae of Mexico and Guatemala*. London: Ackermann, [1837-1843].

Sarah Ann Drake. Album of Botanical Drawings [circa 1830].

Conrad Loddiges and Sons. *The Botanical Cabinet*. London: J. and A. Arch, 1817-1833.

NOTES

Introduction

1 Thad Logan, *The Victorian Parlour: A Cultural Study* (Cambridge: Cambridge University Press, 2001), p. 124.

2 These lines are from a poem by David Landsborough or his daughters, which was published on the title-page of Landsborough's *Treasures of the Deep; or, Specimens of Scottish Sea-Weeds* (Glasgow: David Bryce, 1847).

3 Single illustrated plates from periodicals often indicate 'book breaking' — the removal of attractive plates from a bound item by a dealer.

4 See, for example, the University of Glasgow's Library's album, https://www.flickr.com/photos/uofglibrary/sets/72157625414810565/ (accessed 22 November 2018).

5 See Alexander Montagu Browne, *Practical Taxidermy* (London: Upcott Gill, 1884), p. 262.

6 The major studies of Victorian natural history are Lynn Barber, *The Heyday of Natural History, 1820-1870* (London: Jonathan Cape, 1980); David Elliston Allen, *The Naturalist in Britain: A Social History* (Princeton: Princeton University Press, 1994); and, Lynn L. Merrill, *The Romance of Victorian Natural History* (Oxford: Oxford University Press, 1989).

7 See David Allen, 'Tastes and Crazes,' in *Cultures of Natural History*, ed. N. Jardine, J.A. Secord, and E.C. Spary (Cambridge: Cambridge University Press, 1996), p. 394-407.

8 See, for example, Ann B. Shteir, *Cultivating Women: Cultivating Science* (Baltimore: Johns Hopkins University Press, 1996); Barbara T. Gates, *Kindred Nature: Victorian and Edwardian Women Embrace the Living World* (Chicago: University of Chicago Press, 1998); and Theresa M. Kelley, *Clandestine Marriage: Botany and Romantic Culture* (Baltimore: Johns Hopkins University Press, 2012).

Chapter One: Plants and the Matter of the Victorian Book

1 [Mary Matilda Howard], *Mary's Scrap Book, By a Lady* (London: Wm. S. Orr and Co., 1838), p. 52.

2 My interest in how readers used botanical books to house their own specimens runs parallel to that of Anne Secord in her essay, 'Pressed into Service: Specimens, Space, and Seeing in Botanical Practice,' in *Geographies of Nineteenth-Century Science*, ed. David N. Livingstone and Charles W.J. Withers (Chicago: University of Chicago Press, 2011), p. 283-310.

3 Other examples include John Lindley's *Elements of Botany* (1841) and George Bentham's *Handbook of the British Flora* (1865).

4 For the status of Linnaeus's system during the Victorian period, see Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science* (Chicago: University of Chicago Press, 2010), p. 172-74.

5 Withering's national flora appeared in two more editions while the author was alive and four more under his son. For these editions, see David Elliston Allen, *Books and Naturalists* (London: HarperCollins, 2010), p. 99.

6 Withering, *An Arrangement of British Plants* (London: Cadell and Davies, 1818), vol. 1, p. 31-35.

7 *Ibid.*, p. 31-32.

8 *Ibid.*, p. 100.

9 The reference to the purpose-built botanical cabinet is at *ibid.*, p. 37.

10 *The Monthly Visitor and Entertaining Pocket Companion*, vol. X, June 1800, p. 215.

11 William Mavor, *The Lady's and Gentleman's Botanical Pocket Book: Adapted to Withering's Arrangement of British Plants* (London: Vernor & Hood, [1800]), Preface, v.

12 *Ibid.*, Preface, x and Introduction, viii. For a discussion of Mavor's Withering, see Secord, 'Pressed into Service,' p. 286-87.

13 These annotations are found in the Fisher's copy of Mavor, p. 4 & 12, 152.

14 Allen, *Books and Naturalists*, p. 100.

15 The price of the 1835 edition appears as a publisher's advertisement in the Fisher copy. In 1830, the four-volume edition of Withering in boards was priced at £2 16s., Advertisement in *The London Literary Gazette*, 17 April 1831, no. 691, p. 263.

16 William Withering and William MacGillivray, *A Systematic Arrangement of British Plants*, (London: Scott, Webster, and Geary, 1835), iii.

17 *Ibid.*, viii.

18 *Ibid.*, vii & p. 5.

19 *Ibid.*, p. 33.

20 *Ibid.*, p. 34-37.

21 Alexander Thomson, Hortus Conservatio, or Garden Preservation of Plants Indigenous and Exotic (England, 1823). I have been unable to trace Thomson in the historical record.

22 *Ibid*, fols. 13 & 63, 25, 42.

23 For the challenges of transporting plant material across vast distances, see Christopher M. Parsons and Kathleen S. Murphy, 'Ecosystems under Sail: Specimen Transport in the Eighteenth-Century French and British Atlantics,' *Early American Studies* 10, no. 3 (Fall 2012), p. 503-39, and Mark Laird and Karen Bridgman, 'American Roots: Techniques of Plant Transportation and Cultivation in the Early Atlantic World,' in *Ways of Making and Knowing: The Material Culture of Empirical Knowledge*, ed. Pamela H. Smith, Amy R. W. Meyers, and Harold J. Cook (New York: Bard Graduate Center, 2014), p. 164-93.

24 Withering, *An Arrangement of British Plants*, p. 38.

25 Secord makes a similar point in 'Pressed into Service' when she discusses the 'provision' of space in botanical books that might be filled with

specimens, p. 288. For the early modern cabinet of curiosities, see Zytaruk, 'Cabinets of Curiosities and the Organization of Knowledge,' *University of Toronto Quarterly*, vol. 80, no. 1 (2011), p. 1-23.

26 Heather Jackson, *Marginalia: Readers Writing in Books* (New Haven: Yale University Press, 2001), p. 101.

27 Leah Price, *How to Do Things with Books in Victorian Britain* (Princeton: Princeton University Press, 2012), p. 6.

28 Withering and MacGillivray, *A Systematic Arrangement of British Plants*, p. 60 & 144, 99, 328, 94, 160, 93, 116, 158, 181, 253, 64, 121.

29 *Ibid.*, p. 193.

30 *Ibid.*, p. 331. For an account of how one owner of a botanical handbook by George Bentham added her own paintings to her copy, see D. E. Allen, 'An 1861 instance of "painting one's Bentham,"' *Archives of Natural History*, vol. 31, no. 2 (2012), p. 356-67.

31 *Ibid.*, p. 116 & 176.

32 For an account of Parr Traill's childhood and the move to Reydon Hall, see Michael A. Peterman, 'Catharine Parr Strickland,' in *Oxford Dictionary of National Biography* (accessed 14 September 2018).

33 Withering, *An Arrangement of British Plants*, vol. 3, p. 710.

34 *Ibid.*, vol. 4, at p. 275.

35 Rosemary Mitchell, 'Agnes Strickland,' in *Oxford Dictionary of National Biography* (accessed 14 September 2018).

36 Catharine Parr Traill, *The Backwoods of Canada: Being Letters from the Wife of an Emigrant Officer* (London: Charles Knight, 1836), p. 233. At p. 91, in a letter to her mother, Parr Traill expresses the same regret about not allowing Elizabeth to train her in botany.

37 *Ibid.*, p. 254.

38 Angela Byrne, '"My Little Readers": Catharine Parr Traill's Natural Histories for Children,' *Journal of Literature and Science*, vol. 8, no. 1 (2015): p. 90.

39 For Parr Traill's scientific career, see Marianne Gosztonyi Ainley, 'Science in Canada's Backwoods,' in *Natural Eloquence: Women Reinscribe Science*, ed. Barbara T. Gates and Ann B. Shteir (Madison: University of Wisconsin Press, 1997), p. 79-97.

40 Parr Traill, *Backwoods*, p. 238.

41 *Ibid.*, p. 250.

42 Agnes Chamberlin and Parr Traill, *Studies of Plant Life in Canada; or, Gleanings from Forest, Lake, and Plain* (Ottawa: A.S. Woodburn, 1885), p. 241.

43 Parr *Backwoods*, p. 252-53.

44 Endersby, *Imperial Nature*, p. 54-83.

45 Parr Traill, *Backwoods*, p. 91.

46 Parr Traill refers to the *hortus siccus* she plans to make Elizabeth in *Backwoods*, p. 91. The gift of Lady Greville's screw press is described in *I Bless You in My Heart: Selected Correspondence of Catharine Parr Traill*, ed. Carl Ballastadt, Elizabeth Hopkins, and Michael A. Peterman (Toronto: University of Toronto Press, 1996), p. 117.

47 Parr Traill, *Backwoods*, p. 239.

48 Agnes Chamberlin and Parr Traill, *Canadian Wild Flowers* (Montreal: John Lovell, 1868), p. 25.

49 Parr Traill, *Backwoods*, p. 235 & 237-38, 239-40, 245.

50 Parr Traill to Frances Stewart, 28 April 1853, in *I Bless You in My Heart*, p. 80.

51 *Ibid.*, Parr Traill to Frances Stewart, 4 September 1853, p. 86.

52 *Ibid.*, Parr Traill to Ellen Dunlop, 10 September 1857, p. 109.

53 *Ibid.*, Parr Traill to Kate Traill, 16 May 1863, p. 152.

54 *Ibid.*, Parr Traill to Ellen Dunlop, 23 May 1860, p. 146.

55 *Ibid.*, Parr Traill to Frances Stewart, 27 October 1862, p. 150.

56 *Ibid.*, Parr Traill to Frances Stewart, 28 April 1853, p. 78-79.

57 *Ibid.*, Parr Traill to William Traill, 12 November 1882, p. 224.

58 Well-preserved examples of Parr Traill's herbaria are held in the botanical collections of the Canadian Museum of Nature at Ottawa and at the Royal Ontario Museum in Toronto.

59 Parr Traill, *Backwoods*, p. 246.

60 Endersby, *Imperial Nature*, p. 112.

61 Anne Secord, 'Botany on a Plate: Pleasure and Power of Pictures in Promoting Early Nineteenth-Century Scientific Knowledge,' *Isis*, vol. 93, no. 1 (March 2002), p. 28-67, at. p. 35.

62 Endersby, *Imperial Nature*, p. 118-19.

63 Parr Traill to the Editor of the *Genesee Farmer*, September 1852, *I Bless You in My Heart*, p. 74-76.

64 Review, 'Canadian Wild Flowers,' *Journal of Education*, vol. 22, no. 2, February 1869, p. 29.

65 Chamberlin and Parr Traill, *Canadian Wild Flowers*, p. 27; The language of flowers was an elaborate system in which flowers were assigned a moral and symbolic meaning. For the genre of sentimental flower books, see Wilfred Blunt, *The Art of Botanical Illustration* (London: Collins, 1955), p. 219-20.

66 Parr Traill to Frances Stewart, 1 March 1869, *I Bless You in My Heart*, p. 176.

67 Charlotte Gray, *Sisters in the Wilderness: The Lives of Susanna Moodie and Catharine Parr Traill* (Toronto: Viking, 1999), p. 294-95.

68 For Chamberlin's watercolours, see Kathryn Martyn, *Agnes Chamberlin 1833-1913: An Exhibition of Water Colours* (Toronto: Thomas Fisher Rare Book Library, 1976)
and the digital collection, https://fisher.

library.utoronto.ca/resources/agnes-chamberlin.

69 Briggs reprinted the 1869 title-page for the 1895 edition, thus complicating the historical record of this edition.

70 Alexander Globe writes that for editions subsequent to the first one in 1868, Chamberlin and her associates began to use transparent washes and stencils to accelerate the colouring process. He also discusses briefly the fourth 'colourist's' edition, 'The Story of Canadian Wild Flowers,' *Historical Perspectives on Canadian Publishing* (accessed 16 September 2018).

71 *Ibid.*

72 Endersby, *Imperial Nature*, p. 115-17

73 For botanical copybooks, see Blunt, *The Art of Botanical Illustration*, p. 218-19. See, also, Gavin Bridson, 'Amateur Colourists — Stand Up and Be Counted,!' *Society for the Bibliography of Natural History Newsletter* (London: British Museum, 1982), p. 10. Bridson notes that readers did sometimes colour the images in their copies of floras and that some eighteenth-century works of ornithology even supplied directions for such colouring.

74 Parr Traill to the Editor of the *Genesee Farmer*, September 1852, *I Bless You in My Heart*, p. 76.

75 Chamberlin and Parr Traill, *Canadian Wild Flowers*, Preface, p. 7.

76 Kristina Huneault, *I'm Not Myself at All: Women, Art, and Subjectivity in Canada* (Montreal: McGill-Queen's University Press, 2018), p. 196.

77 Chamberlin and Parr Traill, *Canadian Wild Flowers*, p. 13.

78 *Ibid.*, p. 60-61.

79 Chamberlin and Parr Traill, *Studies of Plant Life in Canada*, Preface, ix.

80 Parr Traill, *Pearls and Pebbles; or, Notes of an Old Naturalist* (London: Sampson Low, Marston & Company, 1894), p. 101.

Chapter Two: Paper Birds

1 Chamberlin and Parr Traill, *Studies of Plant Life*, xvi-xvii.

2 See Michael A. Peterman, '"Splendid Anachronism"; The Record of Catharine Parr Traill's Struggles as an Amateur Botanist in Nineteenth-Century Canada,' in *Re(Dis)covering our Foremothers: Nineteenth-Century Canadian Women Writers*, ed. Lorraine McMullen (Ottawa: University of Ottawa Press, 1990), p. 173-85, at p. 177-78.

3 See James Edmund Harting's sixth edition of White, *The Natural History of Selborne* (London: Swan Sonnenschein, 1888).

4 Joan Winearls, *Art on the Wing: British, American, and Canadian Illustrated Bird Books from the Eighteenth to the Twentieth Century* (Toronto: University of Toronto, 1999), p. 23. For Bewick's influence during the Victorian period, see Diana Donald, *The Art of Thomas Bewick* (London: Reaktion Books, 2013), p. 181-223.

5 Letter X to Barrington, White, *The Natural History and Antiquities of Selborne*, ed. Edward Turner Bennett (London: J. and A. Arch, 1837), p. 236. Unless otherwise noted, all quotations from the *Natural History* will be to this edition.

6 Parr Traill, *Backwoods*, p. 227.

7 For a recent discussion of White's *Natural History of Selborne* in the context of local and global ecologies, and colonization, see Alan Bewell, *Natures in Translation: Romanticism and Colonial Natural History* (Baltimore: Johns Hopkins University Press, 2017), p. 153-95.

8 Letter XL to Pennant, White, *Natural History*, p. 171 & 170, 169, 174-76.

9 Barber traces this debate in *The Heyday of Natural History*, p. 40-44.

10 Letter XIX to Pennant, White, *Natural History*, p. 106.

11 The enormous popularity of White's *Natural History* during the nineteenth century has been documented fully by Edward A. Martin, *A Bibliography of Gilbert White* (Westminster: Roxburghe Press, 1897); Susan Bruxvoort Lipscomb, 'Introducing Gilbert White: An Exemplary Natural Historian and his Editors,' *Victorian Literature and Culture*, vol. 35, no. 2 (2007): p. 551-67, at p. 552; the *Blackwood's Magazine* review is quoted in David Allen, *Books and Naturalists*, p. 117.

12 White, *Natural History*, p. 123.

13 Letter XI to Pennant, White, *Natural History*, p. 52-53.

14 *Ibid.*, Letter XII to Pennant, p. 57.

15 See, William Derham, *The Philosophical Letters between the Late Learned Mr. Ray and Several of his Ingenious Correspondents* (London, 1718).

16 Letter XIX to Barrington, White, *Natural History*, p. 265.

17 Advertisement,' White, *Natural History*, vi.

18 *Ibid.*, Letter XX to Pennant, p. 107.

19 *Ibid.*, Letter III to Barrington, p. 198.

20 James Edmund Harting and White, *The Natural History and Antiquities of Selborne* (London: Bickers & Son, 1876). The folding facsimile sheet is between p. 382 & 383.

21 Letter XXII to Pennant, White, *Natural History*, p. 116.

22 *Ibid.*, Letter V to Pennant, p. 16-17.

23 White's modern biographer Richard Mabey provides an account of these lanes in *Gilbert White: A Biography of the Naturalist and Author of The Natural History of Selborne* (London: Pimlico, 1999), p. 17-18; p. 25-26.

24 This illustration is found at p. 16 of Bennett's 1837 edition.

25 These illustrations are found in William Jardine and White, *The Natural History of Selborne* (London: Nathaniel Cooke, 1853), p. 10 & 13.

26 *Ibid.*, p. 10-13.

27 See Lipscomb, 'Introducing Gilbert White,' p. 555-56 and Mabey, *Gilbert White*, p. 217-18.
28 Buckland and White, *Natural History and Antiquities of Selborne* (London: MacMillan and Co., 1875), p. 11.
29 See Mabey, *Gilbert White*, p. 218.
30 See, for example, James Edmund Harting's edition of White's *Natural History* (London: Swan Sonnenschein, 1887), p. 326-28.
31 Bennett and White, *Natural History*, p. 324-31.
32 Harting and White, *Natural History*, p. 251.
33 This passage from Darwin's 'Recollections of my Mind and Character,' is reproduced in White, *The Natural History of Selborne*, ed. Anne Secord (Oxford: Oxford University Press, 2016), p. 243.
34 Buckland and White, *Natural History*, Preface, vii.
35 Buckland's 1876 edition was also published by MacMillan and Co.
36 According to Geoffrey Wakeman, the period from 1790-1835 was considered the zenith in English wood engraving. See his study, *Victorian Book Illustration* (Newton Abbot: David & Charles, 1973), p. 17.
37 Thomas Bewick, *History of British Birds*, vol. 1 (Newcastle: Hodgson, 1797), Introduction, xxii & xxv-xxvi.
38 For the overlapping chronologies of White and Bewick's respective works, see Jenny Uglow, *Nature's Engraver: A Life of Thomas Bewick* (Chicago: University of Chicago Press, 2006), p. 166-67.
39 Buckland and White, *Natural History*, Preface, ix & xi.
40 Harting and White, *Natural History*, Preface, ix-x.
41 For a biographical account of Fothergill, see James L. Baillie Jr., "Charles Fothergill 1782-1840,' *The Canadian Historical Review*, vol. 25, no. 4 (1944), p. 376-96.
42 Jackson, *Marginalia*, p. 33. As Jackson shows, commercially interleaved copies of a book were also sometimes made available by publishers. Medical books, botanical treatises, guidebooks, and natural history pamphlets — works in which readers might wish to record their own experiences — were subject to commerical interleaving during the nineteenth century. In the case of Bewick's *British Birds*, however, the evidence does not suggest that volumes were issued by the publisher in interleaved copies.
43 See the pair of articles by Hugh S. Gladstone, 'The Fothergill Family as Ornithologists,' *The Naturalist*, no. 784 (May, 1922), p. 149-52 and no. 785 (June 1922), p. 189-92.
44 The Multigraph Collective, *Interacting with Print: Elements of Reading in the Era of Print Saturation* (Chicago: University of Chicago Press, 2018), p. 204-5 & 191.
45 Jackson, *Marginalia*, p. 33.
46 Fisher Library copy of Charles Fothergill, *Ornithologia Britannica* (Stonegate: W. Hick, 1799) interleaved with Fothergill's manu-script notes.
47 For Fothergill's printing enterprise, see Baillie, p. 389-90.
48 Charles Fothergill, Sketches towards a Natural History of the British Empire, Fisher Library, Charles Fothergill Papers, MS 140, vol. 22, n.p.
49 The Fisher copy of Fothergill's two volumes of the 1804 edition of Thomas Bewick, *History of British Birds* are in the Charles Fothergill Papers, MS 140 vols. 31 & 32. This extract from William Fothergill's letter appears MS 140, vol. 31, interleaved p. 149.
50 *Ibid.*, interleaved p. 37
51 *Ibid.*, interleaved p. 49.
52 *Ibid.*, interleaved p. 53.
53 *Ibid.*, interleaved p. 174.
54 *Ibid.*, interleaved p. 36.
55 *Ibid.*, interleaved p. 44.
56 *Ibid.*, interleaved p. 234.
57 *Ibid.*, interleaved p. 179.
58 *Ibid.*, interleaved p. 51.
59 Uglow, *Nature's Engraver*, p. 242-45.
60 Advertisement, vol. 2 of Bewick, *History of British Birds* (Newcastle: Edward Walker, 1804), iii.
61 MS 140, vol. 31, interleaved p. 210. For Tunstall's museum, see Paul Lawrence Farber, *The Emergence of Ornithology as a Scientific Discipline: 1760-1850* (Dordrecht: D. Reidel, 1982), p. 52.
62 *Ibid.*, interleaved p. 74.
63 *Ibid.*, interleaved p. 40.
64 *Ibid.*, interleaved p. 135.
65 MS 140, vol. 22, p. 23.
66 Thomas Bewick, *A History of British Birds: the Figures Engraved on Wood by T. Bewick; and a supplement, with additional figures* (Newcastle: E. Walker, 1821), p. 13 of supplement.
67 Uglow, *Nature's Engraver*, p. 251.
68 MS 140, vol. 31, interleaved p. 38.
69 Diana Donald, *Picturing Animals in Britain, c. 1750-1850* (New Haven: Yale University Press, 2008), p. 53.
70 *Ibid.*, interleaved p. 246
71 Uglow tells us that Bewick's publishers did make some hand-coloured copies available to customers (p. 259), but Fothergill's notes provide evidence that his copy was not one among these.
72 MS 140, vol. 32, interleaved p. 117 & 118.
73 *Ibid.*, interleaved p. 175.
74 *Ibid.*, interleaved p. 199.
75 *Ibid.*, interleaved p. 264 & 265.
76 For the complexities of the term 'extra-illustration,' see Jackson, *Marginalia*, p. 185-86.
77 Fothergill's illustration of the shag is at *ibid.*, interleaved p. 391.
78 Uglow discusses Bewick's equivocal position on shooting, *Nature's Engraver*, p. 255.
79 Advertisement, vol. 2 of Bewick, *British Birds*, iv.

80 For a discussion of Bewick's tail-pieces of rural figures, old soldiers, vagrants, and children, see Donald, *The Art of Thomas Bewick*, p. 92-135.
81 Allen, *The Naturalist in Britain*, p. 127.
82 MS 140, vol. 2, Prices JF sen. gave CR for Birds and Game, n.p.
83 MS 140, vol. 32, p. 31 and interleaved p. 31.
84 *Ibid.*, interleaved p. 34 & 42.
85 *Ibid.*, interleaved p. 48.
86 *Ibid.*, interleaved p. 158.
87 MS 140, vol. 31, interleaved p. 308.
88 *Ibid.*, interleaved p. 327-28.
89 Vol. 1, Bewick, *British Birds*, p. 316.
90 MS 140, vol. 32, interleaved p. 162.
91 *Ibid.*, interleaved p. 95.
92 John Sheail, *Nature In Trust* (Glasgow: Blackie, 1976), p. 10, and Henry M. Cowles, 'A Victorian Extinction: Alfred Newton and the Evolution of Animal Protection,' *British Journal for the History of Science*, vol. 46, no. 4 (2013), p. 695-714, at. p. 708-709.
93 MS 140, vol. 32, interleaved p. 95.
94 *Ibid.*, interleaved p. 383.
95 Sheail, *Nature in Trust*, p. 12.
96 William Henry Hudson, *Lost British Birds* ([London], 1894), p. 1.
97 *Ibid.*, p. 2-4.
98 *Ibid.*, p. 2.
99 *Ibid.*, p. 12 & 13.
100 *Ibid.*, p. 20-22.
101 *Ibid.*, p. 32.
102 For Newton's campaign, see Cowles, 'A Victorian Extinction.' Newton's phrase on the exterminating process is quoted by Cowles at p. 701.
103 IUCN Red List, www.iucn.org/theme/species/our-work/birds (accessed on 6 October 2018).

Chapter Three: Containing Nature: Specimens and Collections

1 Advertisement in the 1860 edition of William Coleman, *British Butterflies* (London: Routledge).
2 Aileen Fyfe, 'Natural History and the Victorian Tourist: From Landscapes to Rock-Pools,' in *Geographies of Nineteenth-Century Science*, p. 371-98, at. p. 372 & 375.
3 For Routledge's *Railway Library*, see the entries in vol. I of Chester W. Topp, *George Routledge*, in *Victorian Yellowbacks and Paperbacks, 1849-1905* (Denver: Hermitage Antiquarian Bookshop, 1993), viii, xi. For Warne's split from Routledge, see vol. IV, *Frederick Warne & Co.*, in the same series (1999), xi.
4 See Kylie Message and Ewan Johnston, 'The World within the City: The Great Exhibition, Race, Class and Social Reform,' in *Britain, the Empire, and the World at the Great Exhibition of 1851*, ed. Jeffrey A. Auerbach and Peter H. Hoffenberg (Aldershot: Ashgate, 2008), p. 27-46, at p. 37.
5 David Allen supplies this figure in *The Naturalist in Britain*, p. 124. This figure also appears in the entry for Wood's book in vol. I of Topp, *George Routledge*, p. 92.
6 William Coleman, *Our Woodlands, Heaths, and Hedges* (London: Routledge, Warnes, & Routledge, 1859), p. 45 & 111, 86-87.
7 John George Wood, *The Common Objects of The Country* (London: George Routledge & Sons, 1866), iii-iv. All subsequent references will be to this edition.
8 For Evans' career, see Ruari McLean, *Victorian Book Design and Colour Printing* (London: Faber & Faber, 1972), p. 178-79.
9 Wood, *Common Objects*, p. 8.
10 *Ibid.*, p. 32.
11 *Ibid.*, p. 94.
12 *Ibid.*, p. 17-19.
13 *Ibid.*, p. 21-22.
14 *Ibid.*, p. 29-30.
15 Sheail, *Nature in Trust*, p. 10
16 Wood, *Common Objects*, p. 5-6.
17 Thomas Brown, *The Taxidermist's Manual; or the Art of Collecting, Preparing and Preserving Objects of Natural History* (Glasgow: Archibald Fullarton & Co., 1833), p. 1.
18 Anne Larsen, 'Equipment for the Field,' in *Cultures of Natural History*, p. 358-77, at p. 371-73.
19 Wood, *Common Objects*, p. 44.
20 *Ibid.*, p. 74.
21 *Ibid.*, p. 106.
22 *Ibid.*, p. 86.
23 *Ibid.*, p.117.
24 *Ibid.*, p. 83.
25 *Ibid.*, p. 123.
26 John George Wood, *Common Objects of the Microscope* (London: Routledge, Warne, and Routledge, 1861), p. 1.
27 *Ibid.*, p. 2-3.
28 *Ibid.*, p. 4.
29 Merrill, *The Romance of Victorian Natural History*, p. 132.
30 Wood, *Common Objects of the Microscope*, p. 27-28.
31 *Ibid.*, p. 54.
32 *Ibid.*, p. 60.
33 *Ibid.*, p. 110-111.
34 These lines are from Clarke's preface to the second edition of her work (1863), which was reprinted in the third edition, *Objects for the Microscope* (London: Groombridge and Sons, 1870), ix. All subsequent references will be to this edition.
35 These lines are from Clarke's preface to the first edition of her work (1858), which is reprinted in the third, v.
36 For Fawcett's career, see McLean, *Victorian Book Design*, p. 200-205.

37 Mary Ward, *A World of Wonders Revealed by the Microscope. A Book for Young Students* (London: Groombridge and Sons, 1858), p. 51.
38 *Ibid.*, p. 36.
39 *Ibid.*, p. 12-13.
40 *Ibid.*, p. 36.
41 Lane, *Objects for the Microscope.*, vi.
42 *Ibid.*, p. 11 & 13.
43 *Ibid.*, ix.
44 *Ibid.*, p. 241.
45 Barbara T. Gates, 'Introduction: Why Victorian Natural History?' *Victorian Literature and Culture*, vol. 35, no. 2 (2007), p. 539-48, at p. 541.
46 Barber, *The Heyday of Natural History*, p. 13.
47 Larsen, 'Equipment for the Field,' p. 358.
48 Charles Alexander Johns, *Sea-Weeds* (London: Society for Promoting Christian Knowledge, 1860), p. 11 & 19.
49 For nature printing, see Wakeman, *Victorian Book Illustration*, p. 60-64.
50 Louisa Lane Clarke, *The Common Seaweeds of the British Coast and the Channel Islands* (London: F. Warne, [1865]), p. 5.
51 *Ibid.*, p. 76.
52 For a recent account of seaweed albums, see Molly Duggins, 'Pacific Ocean flowers' Colonial seaweed albums,' in *The Sea and Nineteenth-Century Anglophone Literary Culture*, ed. Steve Mentz and Martha Elena Rojas (London: Routledge, 2017), p. 119-34.
53 Isabella Gifford, *The Marine Botanist; an Introduction to the Study of Algology* (London: Darnton and Co., [1848]), p. 132.
54 Johns, *Sea-Weeds*, p. 21.
55 Clarke, *The Common Seaweeds*, p. 18-19.
56 *Ibid.*, p. 23 & 88, 113-14, 45, 104-5.
57 The Fisher Library holds copies of the 1847 and 1853 issues of Landsborough's *Treasures of the Deep*. For a recent account of Victorian natural illustrations, see Maria Zytaruk, 'Preserved in Print: Victorian Books with Mounted Natural History Specimens,' *Victorian Studies*, vol. 60, no. 2 (Winter 2018), p. 185-200. See, also, Wakeman, *Victorian Book Illustration*, p. 64-67.
58 William Coleman, *British Butterflies* (London: George Routledge and Sons, [1860]), p. 50 & v-vi. All subsequent quotations will be taken from this edition.
59 *Ibid.*, p. 33-34.
60 *Ibid.*, vi.
61 *Ibid.*, p. 37.
62 *Ibid.*, p. 22-23.
63 *Ibid.*, p. 37.
64 *Ibid.*, p. 49-50.
65 *Ibid.*, p. 50 & 52, 53.
66 *Ibid.*, p. 94-95.
67 Allen has written of the embarrassment to which naturalists were prone, *The Naturalist in Britain*, p. 137-38.
68 Coleman, *British Butterflies*, p. 41-42.
69 *Ibid.*, p. 54.
70 *Ibid.*, p. 54-55.
71 *Ibid.*, p. 56.
72 *Ibid.*, p. 57-58.
73 *Ibid.*, p. 39-40.
74 *Ibid.*, p. 42.
75 *T. Cooke, Naturalist, Priced Catalogue* (London: Napier, [circa 1880]), p. 28 & 30, 36.
76 *Ibid.*, p. 32.
77 *Ibid.*, p. 36.
78 *Ibid.*, p. 13 & 16.
79 *Ibid.*, p. 13 & 15.
80 *Ibid.*, p. 10-12.
81 *Ibid.*, p. 9.
82 *Mary's Scrap Book.*, p. 61 & 73, 71, 74.
83 Adrian Hardy Haworth, *Lepidoptera Britannica* (London: J. Murray, 1803), xxi-xxii; this poem was reprinted in the 1852, second edition, of *The Naturalist's Poetical Companion* (London: Addey and Co.,1852), p. 100-101.
84 Manuscript Album of Entomology by Miss Parker [circa 1820], n.p.
85 *Ibid.*, p. 13 & 15, 21, 29, 65, 94, 63, 92.
86 For Humphreys' career, see McLean, *Victorian Book Design*, p. 99-113; see, also, Marie Korey, *Elegant Editions: Aspects of Victorian Book Design* (Toronto: University of Toronto Library, 1995), p. 43-47.
87 H. Noel Humphreys, *The Butterfly Vivarium; or, Insect Home* (London: William Lay, 1858), p. 4.
88 Larsen makes this point about glass jars and entomology in 'Equipment for the Field,' p. 360.
89 Humphreys, *The Butterfly Vivarium*, p. 1-2 & 8.
90 *Ibid.*, p. 3 & v, viii.
91 *Ibid.*, p. 5.
92 *Ibid.*, p. 6.
93 *Literary Gazette*, 29 May 1858, p. 505.
94 *The Spectator*, 12 June 1858, p. 635.
95 Humphreys, *The Butterfly Vivarium*, p. 6.
96 *Ibid.*, p. 16-19.
97 *Ibid.*, p. 18.
98 *Ibid.*, p. 19-22.
99 *Ibid.*, p. 142-43.
100 *Ibid.*, p. 26-27.
101 Logan, *The Victorian Parlour*, p. 157.
102 Shirley Hibberd, *Rustic Adornments for Homes of Taste* (London: Groombridge and Sons, 1856), p. 122.
103 *Ibid.*, p. 127.
104 Nathaniel Bagshaw Ward, *On the Growth of Plants in Closely Glazed Cases* (London: John Van Voorst, 1852), p. 23. All subsequent references will be to this edition. For a recent exploration of the Wardian case in the context of nineteenth-century environmental threats, see Lindsay Wells, 'Close Encounters of the Wardian Kind: Terrariums and Pollution in the Victorian Parlor,' *Victorian Studies*, vol. 60, no. 2 (Winter 2018), p. 158-70.
105 Ward, *On the Growth of Plants*, p. 93-94.

106 John R. Mollison, *The New Practical Window Gardener* (London: Groombridge and Sons, 1877), p. 2.
107 Hibberd, *Rustic Adornments*, p. 295.
108 Thomas Moore, *British Ferns and their Allies* (London: Routledge, Warne, and Routledge, 1860), p. 5 & 15.
109 Mollison, *Window Gardener*, p. 95-96.
110 David Elliston Allen, *The Victorian Fern Craze: A history of pteridomania* (London: Hutchinson, 1969), p. 53-55.
111 Mollison, *Window Gardener*, p. 141.

Chapter Four: Women in the World of Victorian Botany

1 For this shift in the 1830s, see Shteir, *Cultivating Women*, p. 149-69.
2 For the place of flower-painting in women's education during this period and their work as botanical illustrators, see Ann Berm-ingham, *Learning to Draw: Studies in the Cultural History of a Polite and Useful Art* (New Haven: Yale University Press, 2000), p. 202-27.
3 See Secord, 'Botany on a Plate.'
4 Elizabeth Steele Perkins, *Elements of Drawing and Flower Painting in Opaque and Transparent Water-Colours* (London: T. Hurst, 1834), viii.
5 *Ibid.*, xii-xiii.
6 *Ibid*, xv.
7 *Ibid.*, x.
8 *Ibid.*, x-xi.
9 *Ibid.*, xi.
10 See Bermingham, *Learning to Draw*, p. 211-13 and Blunt, *The Art of Botanical Illustration*, p. 186.
11 Perkins, *Elements of Drawing*, xv & p. 1-2. Bermingham, in *Learning to Draw*, also traces this connection between women and the floral ornaments they drew, and what was meant by 'feminine delicacy' in this context, p. 192-94 and p. 209-10.
12 Perkins, *Elements of Drawing*, p. 2-3 & 5, 7.
13 *Ibid.*, p. 6-8.
14 *Ibid.*, p. 14.
15 *Ibid.*, p. 26.
16 *Ibid.*, p. 27.
17 *Ibid.*, p. 31.
18 *Ibid.*, p. 33.
19 The author thanks Mark Laird for his advice on this point.
20 Brent Elliott discusses the period's vogue for such schemes in *Victorian Gardens* (London: B.T. Batsford, 1986), p. 123-28.
21 See Samantha Matthews, 'Albums, Belongings, and Embodying the Feminine,' in *Bodies and Things in Nineteenth-Century Literature and Culture*, ed. Katharina Boehm (Basingstoke: Palgrave Macmillan, 2012), p. 107-29.
22 A mark of this work's significance is its inclusion in Sacheverell Sitwell and William Blunt's bibliography, *Great Flower Books 1700-1900* (London: Collins, 1956).
23 Margaret Roscoe, *Floral Illustrations of the Seasons, Consisting of the Most Beautiful, Hardy and Rare Herbaceous Plants* (London: R. Havell, and Baldwin and Chadock, 1831), Dedication, n.p.
24 *Ibid.*, v.
25 *Ibid.*, vi.
26 The main text of Roscoe's volume is unpaginated and is organized into entries on individual species. In-text citations will be to plate numbers.
27 Greg Myers, 'Science for women and children: the dialogue of popular science in the nineteenth century,' in *Nature transfigured: Science and literature, 1700-1900*, ed. John Christie and Sally Shuttleworth (Manchester: Manchester University Press, 1989), p. 171-200, at p. 176.
28 See Gates, *Kindred Nature*, p. 37-44,
29 See the entry for James Dalton in Ray Desmond, *Dictionary of British and Irish Botanists and Horticulturalists, Including Plant Collectors, Flower Painters and Garden Designers*, rev. ed. (London: Natural History Museum, and Taylor and Francis, 1994), p. 191.
30 Sarah Mary Fitton, *Conversations on Botany* (London: Longman, Rees, Orme, Green, and Longman, 1834), p. 4. All subsequent quotations will be to this edition.
31 Louisa Anne Twamley, *Our Wild Flowers, Familiarly Described and Illustrated* (London: Charles Tilt, 1839), p. 4. All subsequent quotations will be to this edition.
32 *Ibid.*, p. 3.
33 It is Mant's poem, *The British Months* (1835), to which Aunt Lucy often turns for accounts of particular species. See, for example, Twamley, *Our Wild Flowers*, where Aunt Lucy opens her copy of Mant to find a 'ready-made' description of a holly hedge, p. 84.
34 Fitton, *Conversations*, p. 12.
35 *Ibid.*, p. 5.
36 [Sarah Waring], *A Sketch of the Life of Linnaeus. In a Series of Familiar Letters. Designed for Young Persons* (London: Harvey and Darton, 1827), p. 1 & 3.
37 *Ibid.*, p. 4 & 1.
38 *Ibid.*, p. 12.
39 *Ibid.*, p. 9.
40 *Ibid.*, p. 9 & 5.
41 *Ibid.*, p. 3. Shteir, in *Cultivating Botany*, also offers a reading of the gendering of botany performed in *A Sketch*, p. 149-50.
42 Fitton, *Conversations*, p. 8.
43 Twamley, *Our Wild Flowers*, p. 15.
44 *Ibid.*, vi.
45 *Ibid.*, v.
46 *Ibid.*, p. 34.
47 *Ibid*, p. 67.
48 *Ibid.*, p. 31.
49 *Ibid.*, p. 34.

50 *Ibid.*, p. 194.
51 *Ibid.*, p. 194-95.
52 *Ibid.*, p. 205-207.
53 *Ibid.*, p. 206.
54 *Ibid.*, p. 246-47.
55 Entry for Charles Meredith and Louisa Anne Meredith (neé Louisa Twamley) in http://adb.anu.edu.au/biography/meredith-charles-4187 (accessed 28 October 2018). The same year that she published *Our Wild Flowers*, Twamley married her cousin Charles Meredith (1811-1880) and immigrated to Australia.
56 The above information about the extinction and reintroduction of the lady's slipper in Britain is from Roger Ratcliffe, 'The Secret Garden,' *The Guardian*, 21 June 2007, https://www.theguardian.com/lifeandstyle/2007/jun/21/conservation.endangeredspecies (accessed 2 November 2018).
57 Ewing immigrated to Canada in 1867 and resided in Fredericton until 1869; see Desmond Pacey's entry for 'Juliana Horatia Gatty,' in *The Dictionary of Canadian Biography*, http://www.biographi.ca/en/bio/gatty_juliana_horatia_11E.html (accessed 3 November 2018).
58 Juliana Horatia Ewing, *Mary's Meadow and Letters from a Little Garden* (London: Society for Promoting Christian Knowledge, 1886), p. 54.
59 *Ibid.*, preface, n. p.
60 *Ibid.*, p. 54.
61 All references are to Janet Winifred Houison Craufurd (?-1836). Botany Book. [Kilmarnock], 1829. The notebook is unpaginated.
62 *Oxford English Dictionary*, 'rare,' n., def. 4a.
63 Phil Gates, 'Withered charm of the bird's nest orchid,' *The Guardian*, 16 July 2015, https://www.theguardian.com/environment/2015/jul/16/country-diary-gates-durham-orchids-fungi-trees (accessed 27 October 2018).
64 Entry for the bird's nest orchid, International Union for the Conservation of Nature's Red List for Plants, https://www.iucnredlist.org/species/175996/44484143#assessment-information (accessed 27 October 2018). Given that this assessment is seven years old, one would expect that this species is now at even greater risk.
65 See Merrill, *The Romance of Victorian Natural History*, p. 7-8.
66 Allen, *The Naturalist in Britain*, p. 110.
67 Secord, 'Botany on a Plate.'
68 Loudon's book is also listed in Sitwell and Blunt's *Great Flower Books*.
69 Gates traces this shift in *Kindred Nature*, p. 44.
70 Jane Loudon, *British Wild Flowers* (London: William Smith, 1846), p. 1.
71 *Ibid.*, p. 1.
72 *Ibid.*, p. 2.
73 *Ibid.*, p. 65 & 57-59.
74 *Ibid.*, 47.
75 Here my discussion runs parallel to that of Mary Ellen Bellanca in which she uses the term 'ecological contexts' to describe this feature of Loudon's entries. See Bellanca, 'Jane Loudon's wildflowers, popular science, and the Victorian culture of knowledge,' in *Victorian Writers and the Environment: Ecocritical Perspectives*, ed. Laurence W. Mazzeno and Ronald D. Morrison (London: Routledge, 2017), p. 174-87, at p. 182.
76 *Ibid.*, p. 73 & 74, 76.
77 *Ibid.*, p. 69 & 71.
78 *Ibid.*, p. 68 & 64.
79 Loudon, *British Wild Flowers*, p. 4.
80 *Ibid.*, p. 25 & 27.
81 *Ibid.*, p. 1.
82 *Ibid.*, p. 283.
83 These details of Darwin's orchid publication, and his theory of the co-evolution of orchid and insect are from chapter five of Jim Endersby, *Orchid: A Cultural History* (Chicago: University of Chicago Press, 2016), p. 81-104.
84 Loudon, *British Wild Flowers*, p. 285 & 284.
85 *Ibid.*, p. 286.
86 *Ibid.*, p. 287.
87 *Ibid.*, p. 290.
88 *Ibid.*, p. 290 & 291.
89 *Ibid.*, p. 286.
90 *Ibid.*, p. 287.
91 *Ibid.*, p. 292.
92 Kelley concludes her *Clandestine Marriage* with how the 'natural mimicry' of orchids would have reinforced Darwin's theory of evolution but also raised questions about the 'agency' of plants, p. 261-62.
93 This is Twamley's language from her account of the lady's slipper.
94 Loudon, *British Wild Flowers*, p. 287 & 285.
95 Roscoe's work is reviewed in John Loudon's *Gardener's Magazine*, vol. 7, 1831, p. 73; Loudon's *British Wild Flowers* appears in the 'Gift Books' column of the *Quarterly Literary Advertiser* for December 1852, p. 23.
96 This publisher's advertisement appears in the Fisher copy of Catlow's *Popular Garden Botany* (London: Lovell Reeve,1855), 3.
97 These prices come from the *Gardener's Magazine*, vol. 7, 1831, p. 593 & 596.
98 For the use of Baxter prints by the SPCK and the RTS, see Bamber Gascoigne, *Milestones in colour printing 1457-1859* (Cambridge: Cambridge University Press, 1997), p. 46. The information about the pricing of Pratt's volumes comes from the 'Books Suitable for Presents' column in the 11 December 1860 issue of *The Ecclesiastical Gazette*, p. 162.

Chapter Five: Orchids for the Few

1 Patrick M. Synge, 'An Introduction to the Bibliography,' in Sitwell and Blunt, *Great Flower Books*, p. 35.
2 Blunt, *The Art of Botanical Illustration*, p. 214.
3 Sitwell and Blunt, *Great Flower Books*, p. 48.
4 James Bateman, *The Orchidaceae of Mexico and Guatemala* (London: Ackermann, [1837-1843]), n.p.
5 Endersby, *Orchid*, p. 65.
6 Bateman, *The Orchidaceae*, List of Subscribers, n.p.
7 Blunt, *The Art of Botanical Illustration*, p. 216.
8 Bateman, *The Orchidaceae*, p. 9.
9 The *Oxford English Dictionary* cites a work from 1849 as the first recorded usage of 'orchidomania,' n., def. 2.
10 *Ibid.*, p. 6-7.
11 Ibid., p. 7. The main text of Bateman's text is unpaginated. References will be to the Table number. Grey's vignette is at Tab. XL.
12 Kelley, *Clandestine Marriage*, p. 259. See, also, her account of Bateman's book, p. 247-60, in which she traces the colonial dimensions of plant hunting and the Romantic resonances in Bateman's volume.
13 Bateman, *The Orchidaceae*, p. 6.
14 *Ibid.*, p. 3.
15 *Ibid.*, p. 3.
16 *Ibid.*, n.p. The epiphyte-houses are owned by Sigismund Rucker at Wandsworth and by John Clowes at Broughton Hall, Manchester.
17 *Ibid.*, p. 5.
18 *Ibid.*, p. 5.
19 Endersby, *Orchid*, p. 69.
20 Benjamin Samuel Williams, *The Orchid-Grower's Manual* (London: Chapman and Hall, 1852), viii.
21 'Epiphytes,' vol. IX of the *Penny Cyclopaedia* (London: Charles Knight, 1837), p. 477-81; 'Orchidaceae,' vol. XVI of the *Penny Cyclopaedia*, p. 476-79; 'Oncidium,' the *Penny Cyclopaedia*, vol. XVI, p. 437.
22 Bateman, *The Orchidaceae*, p. 5.
23 *Ibid.*, p. 3
24 *Ibid.*, n.p.
25 *Ibid.*, p. 3.
26 The cockroach vignette is in Tab. IX.
27 *Ibid.*, p. 5.
28 *Ibid.*, Tab. VII.
29 *Ibid.*, Tab. XIII.
30 *Ibid.*, Tab. XXIV.
31 *Ibid.*, Tab. XI.
32 *Ibid.*, Tabs. XVI and XXXII.
33 *Ibid.*, Tab. V.
34 *Ibid.*, Tab. XXVI.
35 *Ibid.*, Tab. XXIII.
36 *Ibid.*, Tab. XIX.
37 *Ibid.*, Tab. XXXV.
38 Williams, *The Orchid-Grower's Manual*, 4th ed. (London: Victoria and Paradise Nurseries, 1871), p. 1.
39 Williams, *The Orchid-Grower's Manual*, 6th ed. (London: Victoria and Paradise Nurseries, 1885), p. 6
40 Williams, *The Orchid-Grower's Manual*, 4th ed., p. 8.
41 For the current threats to orchid populations and conservation initiatives, see Stephan W. Gale, Gunter A. Fischer, Phillip J. Cribb, & Michael F. Fay, 'Orchid conservation: bridging the gap between science and practice,' *Botanical Journal of the Linnean Society*, vol. 186 (2018), p. 425-34.

Epilogue

1 The Fisher Library holds the booksellers' catalogues from Dora Hood's Book Room.

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